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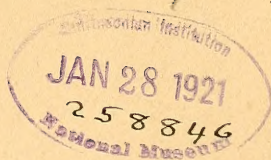
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Insecutor Inscitiae Menstruus

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NOTES ON SOUTH AMERICAN MOSQUITOES IN THE BRITISH MUSEUM

(*Diptera, Culicidæ*)

By J. BONNE-WEPSTER AND C. BONNE

During the years 1916-1919 we collected and studied mosquitoes in Surinam. We compared our material, 110 species, of which some 30 were new, with the collections in the U. S. National Museum in Washington and afterwards went to England to study Theobald's South American types. Mr. F. W. Edwards, of the British Museum, gave us every assistance and allowed us to mount the hypopygium of male types, which makes the identifications more accurate.

Genus *SABETHES* Robineau-Desvoidy

Sabethes bipartipes Dyar and Knab.

This species is identical with the mosquito Theobald described as the supposed male of his *Sabethes nitidus*, but which really is a female. The name *nitidus* cannot stand for this species as already shown by Howard, Dyar and Knab (Mosq. N. & Cent. Amer. & W. Ind., iii, 31, 1915). This species is recorded from Santo Domingo only. Theobald's specimen came from South America and we also found the species in Surinam. *Sabethes chroiopus* Dyar and Knab, a single male from British Guiana, is probably the male of this species as pointed out by us (Ins. Ins. Mens., vii, 165, 1920). The synonymy becomes now as follows:

Sabethes nitidus Theobald (in part), Mon. Culic., ii, 347, 1901.

Sabethes nitidus Theobald (in part), Mon. Culic., iii, 326, 1903.

Sabethes nitidus Blanchard (in part), Les Moustiques, 422, 1905.

- Sabethes bipartipes* Dyar and Knab, Proc. Biol. Soc. Wash., xix, 136, 1906.
- Sabethes nitidus* Coquillett (in part), U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 28, 1906.
- Sabethes nitidus* Peryassú (in part), Os Culicídeos do Brazil, 283, 1908.
- Sabethes nitidus* Theobald (in part), Mon. Culic., v, 575, 1910.
- Sabethes nitidus* Surcouf and Gonzalez Rincones (in part), Essai Dipt. Vuln. Venez., 241, 1911.
- Sabates bipartipes* Howard, Dyar and Knab, Mosq. No. & Cent. Amer. & W. Ind., iii, 30, 1915.
- Sabethes chroiopus* Dyar and Knab, Ins. Ins. Mens., i, 76, 1913.
- Sabethes bipartipes* Dyar, Ins. Ins. Mens., vii, 120, 1919.
- Sabethes chroiopus* Dyar, Ins. Ins. Mens., vii, 120, 1919.
- Sabethes bipartipes* Bonne-Wepster and Bonne, Ins. Ins. Mens., vii, 165, 1920.

***Sabethes tarsopus* Dyar and Knab.**

There are specimens of this species from the Lower Amazon sent by Prof. Goeldi. This extends its range into South America.

***Sabethes schausi* Dyar and Knab.**

There are three specimens of this species in the British Museum; two from British Guiana, one of which has been sent by Mr. Schaus himself, and one from Para from Prof. Goeldi.

***Sabethes albiprivus* Theobald.**

This species is not identical with *Sabethes cyaneus* Fabricius, although there is no constant difference in the cross-veins, the position of which is variable. The colors of the abdomen are not separated in a straight line, however, but deeply incised; sometimes there are nearly complete broad basal violet bands. The golden color of the venter is also more or less present in *cyaneus*. The paddles are present in *albiprivus* only on the first tarsal joint, not on the second as in *cyaneus*. *Albiprivus* is much smaller than *cyaneus*.

Genus SABETHOIDES Theobald

***Sabethoides nitidus* Theobald.**

For the discussion about the name of this species we refer

to Howard, Dyar and Knab (Mosq. No. & Cent. Amer. & W. Ind., iii, 40, 1915). Theobald himself gives the name *confusus* to this species. One of his *confusus* specimens bears a type label. This one has no distinct white patches on the sides of the abdomen. It has a very long and slender proboscis with the point scarcely swollen. It is not a *Sabethoides imperfectus* Bonne-Wepster and Bonne (Ins. Ins. Mens., vii, 165, 1920). In comparing our material of *Sabethoides nitidus* from Surinam with the material in Washington we found some slight differences between the Central American and South American forms.

Genus SABETHINUS Lutz

In the British Museum we found:

1. One larval preparation labeled Dickson, Trinidad, *Sabethoides nitidus*. This is a *Decamyia* species.

2. Another larval preparation labeled Dickson, Trinidad, *Sabethoides nitidus*. This is like *Sabethinus undosus* Coquillett. There must be some confusion here, because the type of *Sabethoides nitidus* has a long and slender proboscis, different from a *Sabethinus* proboscis.

3. One larval preparation labeled *Sabethinus aurescens* Lutz, Brazil. This is like *Sabethinus identicus* Dyar and Knab.

4. One mount of male genitalia labeled *Sabethinus albiprivatus*. There is a male in the collection labeled *Sabethinus albiprivatus* without an abdomen, to which this mount probably belongs. This is recognizable as a *Sabethinus* with four spines on the basal appendages, two spines on the basal accessory lobes.

5. One mount of male genitalia labeled *Sabethinus intermedius*. There is a male labeled *Sabethinus intermedius* without an abdomen, to which the mount probably belongs. This is recognizable as a *Sabethinus* with three spines on the basal appendages.

The following table for the male genitalia results:

Basal appendages with three spines.....*intermedius* Lutz.
Basal appendages with four spines,

albiprivatus Theobald; *undosus* Coq.

Basal appendages with five spines.....*identicus* Dyar and Knab.

Sabethinus identicus Dyar and Knab may be a synonym of *aurescens* Theobald.

Sabethoides purpureus Theobald has a stout proboscis and belongs in the genus *Sabethinus*.

In some descriptions the *Sabethinus* species are supposed to have postnotal scales. We could not find these scales in any of them.

SYNONYMY

Sabethinus Lutz in Bourroul, Mosq. do Brazil, 48, 57, 1904.

Sabethinus Theobald, Mon. Culic., v, 574, 1910.

Sabethinus Howard, Dyar and Knab, Mosq. N. & Cent. Amer. & W. Ind., iii, 31, 1915.

Sabethinus Dyar, Ins. Ins. Mens., vii, 118, 1919.

***Sabethinus moerbista* Dyar.**

Sabethinus moerbista Dyar, Ins. Ins. Mens., vii, 2, 1919.

***Sabethinus purpureus* Theobald.**

Sabethoides purpureus Theobald, Mon. Culic., iv, 617, 1907.

Sabethoides purpureus Theobald, Mon. Culic., v, 585, 1910.

Sabethinus purpureus Dyar, Ins. Ins. Mens., vii, 119, 1919.

***Sabethinus undosus* Coquillett.**

Sabethoides undosus Coquillett, Proc. Ent. Soc. Wash., vii, 186, 1906.

Sabethoides undosus Theobald, Mon. Culic., v, 585, 1910.

Sabethinus undosus Howard, Dyar and Knab, Mosq. No. & Cent. Amer. & W. Ind., iii, 32, 1915.

Sabethinus undosus Dyar, Ins. Ins. Mens., vii, 119, 1919.

***Sabethinus intermedius* Lutz.**

Sabethinus intermedius Lutz, Mosq. do Brazil, 48, 57, 1904.

Sabethinus intermedius Theobald, Mon. Culic., v, 586, 1910.

Sabethinus intermedius Howard, Dyar and Knab, Mosq. No. & Cent. Am. & W. Ind., iii, 32, 1915.

Sabethinus intermedius Dyar, Ins. Ins. Mens., vii, 119, 1919.

***Sabethinus albiprivatus* Theobald.**

Sabethinus albiprivatus Theobald, Mon. Culic., iv., 620, 1907.

Sabethinus albiprivatus Theobald, Mon. Culic., v, 586, 1910.

Sabethinus albiprivatus Dyar, Ins. Ins. Mens., vii, 119, 1919.

Sabethinus aurescens Theobald.

Sabethinus aurescens Theobald, Mon. Culic., iv, 622, 1907.

Sabethes identicus Dyar and Knab, Journ. N. Y. Ent. Soc., xv, 207, 1907.

Sabethoides? identicus Theobald, Mon. Culic., v, 585, 1910.

Sabethinus aurescens Theobald, Mon. Culic., v, 586, 1910.

Sabethes? identicus Theobald, Mon. Culic., v, 585, 1910.

Sabethinus identicus Dyar, Ins. Ins. Mens., vii, 119, 1919.

Sabethinus aurescens Dyar, Ins. Ins. Mens., vii, 119, 1919.

TABLE OF SPECIES

1. Prothoracic lobes blackish scaled, with white at base and tip,
moerbista Dyar
Prothoracic lobes metallic blue or purple.....2
2. Abdomen purple and coppery above.....*purpureus* Theobald
Abdomen bluish or greenish above.....3
3. Hind legs with fifth tarsal joint whitish on under side.....*undosus* Coq.
Hind legs without white.....4
4. Mesonotum metallic green.....*intermedius* Lutz
Mesonotum deep metallic blue.....*albiprivatus* Theobald

Genus LIMATUS Theobald

Limatus paraensis Theobald.

The type of Theobald's *Dendromyia paraensis* is identical with *Limatus cacophrades* Dyar and Knab. The synonymy is as follows:

Dendromyia paraensis Theobald, Mon. Culic., iii, 316, 1903.

Limatus cacophrades Dyar and Knab, Smith. Misc. Colls., Quart. Iss., lii, 266, 1909.

Dendromyia paraensis Theobald, Mon. Culic., v, 592, 1910.

Limatus cacophrades Howard, Dyar and Knab; Mosq. N. & Cent. Amer. & W. Ind., iii, 45, 1915.

Dendromyia paraensis Dyar, Ins. Ins. Mens., vii, 135, 1919.

In Mon. Culic., iii, 361, 1903, Theobald describes the prothoracic lobes as bright ochraceous. In his table in Vol. v, he puts this species in a group with "prothoracic lobes not golden, mauve or white." They are yellow, however. There is a specimen of *Limatus paraensis* from the Upper Amazon. We have many specimens from Surinam and the species seems to be widely spread in tropical America.

Genus LEMMAMYIA Dyar

Lemmamyia asullepta Theobald.

The type of Theobald's *Dendromyia asullepta* is identical with *Lemmamyia methysticus* Dyar and Knab, as suggested by Dyar (1919). Synonymy:

Dendromyia asullepta Theobald, Mon. Culic., iii, 315, 1903.

Limatus methysticus Dyar and Knab, Smiths. Misc. Colls., Quart. Iss., lii, 266, 1909.

Dendromyia asullepta Theobald, Mon. Culic., v, 587, 588, 1910.

Limatus methysticus Howard, Dyar' and Knab. Mosq. N. & Cent. Amer. & W. Ind., iii, 48, 1915.

Lemmamyia methysticus Dyar, Ins. Ins. Mens., vii, 140, 1919.

Theobald does not mention the white on the mid legs, but it is there, although the specimen was a pale one and mounted in such a way that it could only be seen with difficulty. It is present, however, on the three last segments of the mid legs on one side. The abdominal colors are separated in a straight line, the first abdominal segment is clothed with dark scales and not with golden scales as in *pseudomethysticus* Bonne-Wepster and Bonne. The prothoracic lobes have yellowish golden scales. The mesonotal pattern is distinct.

Genus DYARINA, new genus

Theobald's female type of *Phoniomyia longirostris* does not show anything of lateral white abdominal patches, although these are mentioned in his description. He took the character from a perfect male which he combined with the female, but which shows the abdominal colors deeply incised. It looks much more brilliant than the female and probably belongs to another species. The mount of the genitalia of this specimen shows it to be a *Dodecamyia*. But Dyar received a *longirostris* male from Brazil with a quite different clasp filament, which he made the type of his genus *Phoniomyia*, based on genitalic characters. Now there is just as little chance that this male corresponds to Theobald's female type as there is with Theobald's male. The safest way to proceed is to leave Theobald's name *Phoniomyia longirostris* for the rubbed female and to

consider the males of Dyar and Theobald as belonging to two other species differing from *Phoniomyia longirostris*. Theobald's male becomes a new species of the genus *Dodecamyia*. A new generic as well as a specific name must be given to Dyar's male, because there is no reason to keep it in the same genus with the damaged female sent to Theobald in London. We propose the name **Dyarina tripartita**, new genus, new species, and consider it as the type species of the genus *Dyarina* B.-W. & B., which replaces Dyar's genus *Phoniomyia* (not *Phoniomyia* as used by Theobald).

Theobald received a number of females from Trinidad. He named them *Phoniomyia trinidadensis*, but later on identified them with *longirostris*, because they were so similar to his *longirostris* male, not to the female. We share his opinion as to the probable identity and the name *trinidadensis* now becomes available for this male, the name of which should be *Dodecamyia trinidadensis* Theobald.

Dodecamyia trinidadensis Theobald has the mid tarsi in the female and the male faintly white on the apical part of second and distinctly white on all of the third and fourth joints. The hind tarsi have the bases of the fourth and fifth joints white. In the female type of *Phoniomyia longirostris* these parts are missing. Theobald does not mention white on the legs in his description. *Dodecamyia trinidadensis* comes near to *Dodecamyia splendida* B.-W. & B.; but it has the white on the hind legs only on the bases of the two last joints, not on the four last as in *splendida*; it has no tuft of spines on the side piece in the male genitalia and only two spines on the basal appendages.

Dyar and Knab also describe mosquitoes from Trinidad under the name *Phoniomyia trinidadensis*. The genitalia of this species are different from *Dodecamyia trinidadensis* Theobald, and place their males in *Dyarina* B.-W. & B. There remains the possibility that the females from Trinidad Theobald described as *Phoniomyia trinidadensis* really belonged to this species. However, the mesonotum of this species is dull gray brown, the scutellum silvery. The mesonotum of Theo-

bald's females is golden bronzy, the scutellum dark-scaled, and Theobald females are clearly different. The specific name *trinidadiansis* must be dropped for Dyar and Knab's specimens, and we propose the name *Dyarina lassalli*, new species.

Synonymy:

Phoniomyia longirostris Theobald.

Wyeomyia longirostris Theobald, Mon. Culic., ii, 275, 1901.

Phoniomyia longirostris Theobald (in part), Mon. Culic., iii, 311, 1903.

Phoniomyia longirostris Theobald (in part), Mon. Culic., iv, 598, 1907.

Phoniomyia longirostris Theobald (in part), Mon. Culic., v, 576, 1910.

Dodecamyia trinidadiansis Theobald.

Wyeomyia trinidadiansis Theobald, Mon. Culic., ii, 277, 1901.

Phoniomyia longirostris, Theobald (in part), Mon. Culic., iii, 311, 1903.

Phoniomyia longirostris Theobald (in part), Mon. Culic., iv, 598, 1907.

Phoniomyia longirostris Theobald (in part), Mon. Culic., v, 576, 1910.

Dyarina lassalli Bonne-Wepster & Bonne.

Wyeomyia trinidadiansis Dyar & Knab, Proc. Biol. Soc. Wash., xix, 141, 1906.

Wyeomyia trinidadiansis Howard, Dyar & Knab, Mosq. N. & Cent. Amer. & W. Ind., iii, 59, 1915.

Phoniomyia trinidadiansis Dyar, Ins. Ins. Mens., vii, 121, 1919.

Dyarina tripartita Bonne-Wepster & Bonne.

W[yeomyia] longirostris Howard, Dyar & Knab, Mosq. N. & Cent. Amer. & W. Ind., iii, 61, 1915.

Phoniomyia longirostris Dyar, Ins. Ins. Mens., vii, 121, 1919.

Dodecamyia quasilonirostris Theobald.

Phoniomyia quasilonirostris Theobald, Mon. Culic., iv, 598, 1907.

Phoniomyia quasilonirostris Theobald, Mon. Culic., v, 577, 1910.

This species is probably not identical with *Dodecamyia trinidadiansis* Theobald and still more probably not with the damaged type of *Phoniomyia longirostris* Theobald. The white on the mid legs is the same as in *trinidadiansis*, but the

fifth tarsal joint is white too. The hind legs of the specimen from Mana are like those in *trinidadensis*; the specimen from Brazil has the white on the hind legs on the bases of the two last tarsal joints well developed, and traces of white on the second and third, and is more like *splendida*. Almost certainly the species, if distinct, will be a *Dodecamyia* species.

Dyarina pallidoventer Theobald.

Phoniomyia pallidoventer Theobald, Mon. Culic., iv, 598, 1907.

Phoniomyia pallidoventer Theobald, Mon. Culic., v, 577, 1910.

There is not much left of the type but legs and a mount of the male genitalia. This is far from perfect but is recognizable as a mount of a *Dyarina* species. The basal arm seems to be divided again but this is not clearly visible. Theobald indicated the peculiar structure of the clasp already in Mon. Culic., iv, 599, where he writes, "The claspers large and curved with a large acute process arising from the base about half the length of the clasper." By this process he did not mean the basal arm but the other short one, half way up. The white on the mid legs on one side of the first joint, second and third all round, fourth on one side basally, fifth all black. The fifth segment is very short, fourth and fifth segment distinctly thickened, the last two hind tarsals white at base beneath.

TABLE OF DODECAMYIA DYAR

1. Side piece without tuft of spines.....2
Side piece with a tuft of spines near or beyond the middle.....3
 2. Basal appendages with four long spines.....*clazoleuca* Dyar & Knab
Basal appendages with two spines.....*trinidadensis* Theobald
 3. Spines near the middle of the side piece.....*aphobema* Dyar
Spines near the apex.....*splendida* Bonne-Wepster & Bonne
- Of *Dodecamyia quasilongirostris* the male is unknown.

TABLE OF DYARINA BONNE-WEPSTER & BONNE

1. Expansion on basal arm of clasp divided....*pallidoventer* Theobald
Expansion on basal arm of clasp simple.....2
2. This expansion smooth, apical hook recurved,
tripartita, Bonne-Wepster & Bonne
This expansion pilose denticulate on the margin, apical hook
laterally directed*lassalli* Bonne-Wepster & Bonne

Genera DENDROMYIA and WYEOMYIA Theobald

Wyeomyia oblita Lutz.

Dendromyia oblita Lutz, Mosq. do Brazil, 49, 68, 1904.

Dendromyia oblita Theobald, Mon. Culic., iv, 512, 1907.

Dendromyia oblita Theobald, Mon. Culic., v, 591, 1910.

Wyeomyia oblita Dyar, Ins. Ins. Mens., vii, 128, 1919.

Wyeomyia fallax Bonne-Wepster & Bonne, Ins. Ins. Mens., vii, 110, 1919.

Wyeomyia fallax Dyar, Ins. Ins. Mens., vii, 128, 1919.

There are no differences visible between *Wyeomyia fallax* B.-W. & B. and *Dendromyia oblita* Lutz. We consider them identical. Only one female is present, sent by Lutz. It has the same narrow wing scales as *Wyeomyia fallax* B.-W. & B. The name should be *Wyeomyia oblita* Lutz. Peryassú does not describe white on the legs. Perhaps he did not see it, or Lutz had two species in his material.

Dendromyia ulocoma Theobald.

This cannot be *Cleobonnea occulta* Bonne-Wepster & Bonne, as supposed by Dyar (Ins. Ins. Mens., vii, 134, 1919), because there are no postnotal scales. The condition of the specimen is too bad to be recognizable.

Wyeomyia grenadensis Edwards.

This is probably identical with *Dodecamyia clasoleuca* Dyar & Knab, as supposed by Dyar (Ins. Ins. Mens., vii, 139, 1919).

Wyeomyia grayi Theobald.

The specimens from St. Lucia and Grenada have all the characters of *Wyeomyia abebela* Dyar & Knab, from southern Mexico.

Wyeomyia pertinans Williston.

The type is a male with the base of the proboscis pale white beneath. Postnotum and clypeus without scales. Eyes with a white-scaled border. A white spot on the occiput. Abdominal colors separated in a straight line. Prothoracic lobes dark throughout. Scutellum concolorous. Legs dark. The mount of the genitalia shows it to be a *Wyeomyia*. Three hairs on the side-piece. Clasp filament with long stem and three short

lobes, one broad squarely ended, with one angle produced, with a series of small hairs on the margin; lateral lobes much smaller, one with a bent appendage. No core visible.

There is still another male besides the type, of the same locality and sent at the same time. This is a poorly developed small *Lesticocampa* species, bred perhaps from the same lot of larvae as *Wyeomyia pertinans* and preying upon them. From the same locality and at the same time by the same collector *Lesticocampa perturbans* Williston was sent, and it represents probably a specimen of this species (compare genus *Lesticocampa*).

***Dendromyia quasiluteoventralis* Theobald.**

Only a female specimen is present without a type label. It differs distinctly from Theobald's description by having white on the mid legs. The locality on the label is New Amsterdam, which is different from the localities mentioned in Theobald's original description. The hind legs of the specimen are lost. It is perhaps *Wyeomyia oblita* Lutz, but the specimen is too much damaged to be sure.

***Dendromyia luteoventralis* Theobald.**

It cannot be placed. The legs are unbanded. The eyes have a continuous white border. Median distinct white line on occiput. Colors of the abdomen separated in a straight line. Scutellum dark. Prothoracic lobes dark, with coppery tips. Proboscis swollen, dark, not white below. Palpi short, dark. Mesonotum dark. Postnotum and clypeus without scales.

Genus TRIAMYIA Dyar

***Triamyia personata* Lutz.**

Dyar supposed already (Ins. Ins. Mens., vii, 121, 1919) that *Dendromyia personata* Lutz came in his new genus *Triamyia*. We can confirm this by the examination of a mount of the genitalia of Lutz's species. The side-piece is moderate, attenuated at the apex; insertion of clasp filament apical. On the side-piece a long ridge of numerous long wavy hairs. Basal lobes setose. Clasp filament slender, long, a triangular

widening with a flattened spine at one of its angles and a slender branch near the base. Harpes broad, inner edge thickened, curving at tip and ending in a few teeth; moderately long and slender hairs present on one margin. Unci forming a basal cone. Basal appendages low, each bearing four or three small hairs.

Genus JOBLOTIA Blanchard

Joblotia compressum Lutz.

Hypopygium. Side pieces conical, over twice as long as wide; at the base a rounded lobe is present, with long setae reaching to tip of side piece. Clasp filament long and slender with an inserted subterminal double claw. Harpes flat, slender, with bent tip. Basal appendages widely separated, each with about ten long setæ.

Genus GOELDIA Theobald (1903)

The genera *Isostomyia* Coquillett (1906), *Binotia* Blanchard (1904), *Hyloconops* Lutz (1907), *Lesticocampa* Dyar and Knab (1906) become synonyms of *Goeldia* Theobald (1903), as will be shown below. *Runchomyia* Theobald (1903) was preoccupied. For the synonymy of *Lesticocampa* Dyar and Knab, we refer to Howard, Dyar and Knab (Mosq. N. & C. Amer. & W. Ind., iii, 163, 1915).

Goeldia lunata Theobald.

The head of the type of *Wyeomyia lunata* Theobald, a female, is missing. The scutellum is concolorous with the mesonotum. Several other specimens, all from Rio, put here by Theobald have the clypeus nude and also the scutellum concolorous with the mesonotum. Amongst them is a male, the genitalia of which we mounted. We do not see differences with the genitalia of *Lesticocampa rapax* Dyar and Knab, only the tip of the side piece is rounded, not conical. This male has long palpi like *rapax*. The proboscis of this species is very long and pointed. A complete description of the male genitalia is as follows: Side pieces twice as long as wide, tips

rounded, not conical. Basal lobes with many long setæ. Clasp filament long and slender, becoming narrower a small distance from its base, with terminal appendage. Harpes prominent, with thickened margin and spinose tip. Unci forming a basal cone. Basal appendages short, broad, large, near each other but not contiguous, each with seven long, coarse setæ.

Goeldia longipalpis Theobald.

Under the name *Hyloconops longipalpis* Theobald describes three specimens without designating a type. Two of them are females, one is a male. They were sent by Lutz from Brazil. One of the females has a pale ring on the hind tibiæ and differs from the two others in many details. First we give a description of this female with ringed tibiæ:

Proboscis rather short, black. Labellæ pointed, paler. Palpi one-third of the proboscis, black. Clypeus gray, rounded, nude. Antennæ slender. Eyes black. Head clothed with flat white scales with grayish violet luster, a row of erect black scales behind.

Prothoracic lobes well separated, with whitish, flat, elliptical scales. Mesonotum with white scales on front and side margins. Disk black, covered with small bronzy brown narrow curved scales, broader in front of scutellum. Scutellum with broader, flat brown scales with grayish luster. Postnotum without scales, with a group of setæ posteriorly. Pleuræ and coxæ brown, with patches of white scales.

Abdomen strongly depressed, black above with coppery violet luster, venter silvery golden. Colors separated in a nearly straight feebly angulated line. A black shade on the mid ventral line.

Wings hyaline clothed with fusiform and elliptical scales, petiole of second marginal cell about one-fourth of its cell, that of second posterior cell shorter. Basal cross vein about its own length distant from anterior cross vein.

Legs dark, femora pale beneath. Hind tibiæ with a pale white spot at outer third, forming a ring with a narrow opening on upper side.

This species seemed to come near to *Lesticocampa moralesi* Dyar and Knab, but this was described with the ring on the hind femur. This could be an error of observation of course, so we wrote to Washington and Mr. C. T. Greene, of the U. S. Nat. Mus., kindly informed us, that the ring in *moralesi* is present on the tibia and not on the femur. We consider this specimen now identical with *Lesticocampa moralesi* Dyar and Knab.

Theobald's description of *Hyloconops longipalpis* does not say anything about a white ring and is evidently based on the two other specimens. Surcouf and Gonzales-Rincones (Essai Dipt. Vuln. Venez.), however, mention the ring and they have their information from Peryassú (Os Culicideos do Brazil), who saw Lutz specimens, which probably belonged to two species. The name *longipalpis* was given by Lutz, but without a description. We retain the name for the species with unbanded hind tibiæ on which Theobald's description of *longipalpis* was based.

A few amendments can be made in Theobald's description of *longipalpis*. Palpi of the female one-fourth of the proboscis. Hardly any scales on the basal prolongation of the third vein. In the female peacock colored scales only on the scutellum, in the male on scutellum and also before the scutellum on the mesonotum. Basal cross vein half its length basally distant from anterior cross vein.

Longipalpis is more brilliantly violet than *moralesi* Dyar and Knab. The female palpi are shorter, the scutellum has other scales; the abdominal colors are deeply incised.

The male palpi of *longipalpis* are as long as the proboscis. The clypeus is nude, the postnotum has no scales.

Longipalpis differs from *lunata* by the shortness of the proboscis, which is shorter than the abdomen and absolutely different from the proboscis of *lunata* and by the presence of the peacock scales, and the male palpi are longer. *Lesticocampa rapax* Dyar and Knab also has a long proboscis like *lunata*, and the stem of the second marginal cell is one-half of its cell and not one-fourth as in *longipalpis*.

The male genitalia are indistinguishable from those of *rapax*, only the basal appendages seem more contiguous.

Goeldia pallidiventer Theobald.

A male and a female are present, sent by Lutz. They are very similar to *longipalpis*. The male palpi are just as long, the female has no wings, the male has the cross veins as in *longipalpis*. The color of the venter is golden as in *longipalpis*. The only remaining difference is the color of the abdomen, which is more greenish blue in this species, violet in *longipalpis* and the female palpi are one-sixth of the proboscis. The male genitalia are like those of *longipalpis* but the basal appendages are completely contiguous. It cannot be *rapax* because of the proboscis and the stem of the second marginal cell is one-third of its cell.

Goeldia frontosa Theobald.

There are two females from British Guiana, one of them labeled type. The original description was based on these females as Theobald states himself. Later on he added three other specimens from Brazil, one of which he called a male. He gave this male a second type label. This male is a female, however, and all these three Brazilian females are females of *Goeldia lunata* and have nothing to do with the females from British Guiana. They have the colors of the abdomen deeply incised, whereas the true *frontosa* has them separated in a straight line. The male of *frontosa* remains unknown therefore.

Runchomyia was founded by Theobald on the presence of a conical prominence in front of the head between the tori above the clypeus. This character is certainly present in Theobald's type of *frontosa*, but also in many other species when looked for. We saw it, e. g., even much more distinctly in a male *Joblotia digitatus* Rondani, and a female *Lesticocampa culicivora* Dyar and Knab. It is not always equally distinct, and is probably an artifact due to shrinking. *Runchomyia* is an earlier name for *Lesticocampa* and nothing else. The post-notum has no scales. Clypeus without scales or hairs. The

proboscis is very long and slender as in *lunata* and not like *longipalpis*, *pallidiventer* and *moralesi*. It is not *rapax*, because the abdominal colors are separated in a nearly straight line, although there are some peacock scales on the scutellum visible. It is not *dicellaphora*, because the mid lobe of the scutellum is not silvery.

Runchomyia was preoccupied by *Rhynchomyia* Rob. Desv. and *Binotia* proposed as a substitute by Blanchard in 1904. *Goeldia* Theobald (1903), however, is available.

***Goeldia fluviatilis* Theobald.**

Based upon a male. Later a female was added. This is in poor condition with only one mid and one hind leg. It is still recognizable as a rubbed female of *Prosopolepis flui* Bonnewepster and Bonne. It came from British Guiana.

The male has disappeared. It is described, however, with an incomplete white ring on the hind tibiæ. There is but one allied species with this character, viz., *Lesticocampa moralesi* Dyar and Knab. There is nothing in Theobald's description, which does not fit this species except the presence of scales on the postnotum. Theobald did not see these scales, however, and only mentions them because Lutz wrote him they were present. There was probably some confusion. A few striking characters of *moralesi* are also mentioned in Theobald's description of *Goeldia fluviatilis*, viz., the length of the female palpi (one-third), the white scales of the prothoracic lobes, the broader scales on the scutellum and the back part of the mesonotum and the tibial ring of course.

For all these reasons we consider *Lesticocampa moralesi* Dyar and Knab a synonym of *Goeldia fluviatilis* Theobald. We believe that the so-called male type of *Goeldia fluviatilis* was placed by some error by Theobald with his specimen of *Hyloconops longipalpis* and that the female with the ringed hind tibiæ we found there, represents the missing male of *Goeldia*.

***Goeldia perturbans* Williston.**

Under the name *Aedes perturbans* Williston we found two

males without an abdomen, both with short palpi, and two females labeled type. They come extremely near *frontosa* Theobald and *dicellaphora* Dyar and Knab; but the mid lobe of the scutellum is concolorous with the mesonotum. The specimens are much rubbed, however. There is still another reason to consider *perturbans* a distinct species. As mentioned already in the notes on *Wyeomyia pertinans* Williston, we found a *Lesticocampa* male amongst the *pertinans* material. This *Lesticocampa* now becomes a *Goeldia*, of course. From the same locality at the same time by the same collector the *perturbans* specimens were sent, so probably this male also represents a *perturbans* male. More so still because *perturbans* is the only *Goeldia* species from St. Vincent in the British Museum. We mounted the genitalia of this male. Side piece very slender, at least four times as long as wide, clothed with scales and hairs. Clasp filament long, slender, attenuated, with rounded terminal appendage. Basal lobe continued as a crest on inner side of the side-piece to its base. A densely setose ridge or area with long hairs near the apex of the side-piece. Harpes very short, terminating in a single spine. Unci a basal cylinder. Basal appendages not contiguous, each with seven spines. The setose area near the apex separates it immediately from all the other *Goeldia* species.

TABLE OF THE SPECIES OF THE GENUS GOELDIA

1. Mid tarsi only marked with white,
lampropus Howard, Dyar & Knab
Hind tarsi marked with white.....2
Tarsi all black.....5
2. Hind tarsi marked with white at bases of joints; mid tarsi
without white.....*schedocyclica* Dyar and Knab
White markings at the tips of mid and hind tarsi.....3
3. Second hind tarsal joint not ciliate; tip of fourth joint white,
leucopus Dyar and Knab
Second hind tarsal joint ciliate; over half of the fourth joint
white5
4. Palpi of female as long as six joints of antennae
longipes Fabricius
Palpi of female as long as four joints of antennae,
culicivora Dyar and Knab

5. Proboscis very long and slender at least as long as the abdomen..6
 Proboscis moderately long, shorter than the abdomen.....9
6. Abdominal colors separated in a nearly straight line.....7
 Abdominal colors incised8
7. Scutellum silvery on mid lobe.*dicellaphora* Howard, Dyar and Knab
 Scutellum with peacock scales.....*frontosa* Theobald
 Scutellum concolorous with mesonotum.....*perturbans* Williston
8. Scutellum with peacock blue scales.....*rapax* Dyar and Knab
 Scutellum concolorous with mesonotum.....*lunata* Theobald
9. Scutellum concolorous with mesonotum.....*fluviatilis* Theobald
 Scutellum with peacock blue scales.....10
10. Abdomen violet above.....*longipalpis* Theobald
 Abdomen bluish green above.....*pallidiventer* Theobald

We have not placed *Goeldia lineata* Peryassú, *Goeldia vonplesseni* Dyar and Knab, *Goeldia trichopus* Dyar, *Goeldia espini* Martini, and *Goeldia paranensis* Brèthes.

Genus CULEX Linnaeus

Culex subfuscus Theobald.

One male from Jamaica; one preparation male genitalia. Seems to be related or identical with *Culex corniger* Theobald. The mass of denticles between the arms of the second uncal plate is present, also the three filaments, the leaf and another filament beyond. Instead of one seta near the base of the leaf, there seem to be two setæ however. There are pale scales near the antescutellar space as in *corniger*, but if it is *corniger*, it is an unadorned specimen.

Culex palus Theobald.

We made a mount of the male type from Barbados sent by Dr. Low. This places the species in *Culex factor* or *inflictus*, the basal lobe showing three rods, a leaf and a seta on an undivided lobe. The female type of Theobald is from St. Vincent and may be different. The genitalia of the male from British Guiana (fig., Mon. Culic., iv, 456, 1907), are from a different species.

Culex scholasticus Theobald.

This species was considered the same as *Culex inflictus* Theobald by Edwards and Dyar. The male genitalia of

inflictus are described by Dyar as indistinguishable from *factor* Dyar and Knab (Ins. Ins. Mens., vi, 95, 1918). The male genitalia of the male type of *scholasticus* Theobald, however, are different from those of *factor*. The basal lobe consists of two parts; the inner part forms a well defined and rather elongate lobe with three rods, more outwardly a leaf and a filament are present on a distinct prominence but arising more or less immediately from the side piece far away from the lobe with the three rods. It must be a species closely related to *Culex extricator* Dyar and Knab, probably the same. The types are from Grenada.

Culex similis Theobald.

The original type of this species was a female from Jamaica (Mon. Culic., iii, 207, 1903). Later on Theobald added a male from British Guiana as the male type of the species. This male was bred together with several females from the trunk of a hollow tree. The females were considered identical with the female *Culex similis*. We mounted the genitalia of this male, which is a male of *Culex factor* Dyar and Knab. The species was based on the female type, which probably belongs to another species. There is also a mount labeled *Culex similis* Theobald, St. Vincent, Dr. Low. This is a *Culex factor*. A trunk of a hollow tree is not a common breeding place of *Culex factor*, but apparently it was not a regular tree hole but water had collected on the ground in a hollow tree. We also found swamp larvæ in similar locations in Surinam, e. g., larvæ of *Culex declarator* Dyar and Knab.

Culex inflictus Theobald.

Only a female type can be found and only a female has been described by Theobald from Grenada. It looks just like *scholasticus* with which it can be considered identical.

Culex annulipes Theobald.

On the occiput some upright forked and many narrow curved whitish scales. Palpi white tipped. Mesonotum with bronzy brown narrow curved scales. Proboscis unbanded. Abdomen

with distinct white basal lateral spots and ventral bands. Wing scales elliptical. Hind tarsi with rings on both ends, last joint white. Fore and mid legs without rings. This species comes near *taenioopus*.

Melanoconion theobaldi Lutz.

Identical with *Culex chrysonotum* Dyar and Knab.

Melanoconion luteopleurum Theobald.

A very striking mosquito. Proboscis moderate, black. Palpi very short. Head clothed with some narrow curved gray scales especially on the eye margins and many yellow upright forked scales and some flat creamy ones laterally. Prothoracic lobes collar like, yellow. Mesonotum black with black narrow curved scales. Pleuræ deep yellow, the yellow separated from the dorsal black in a sharp straight line. Scutellum black. Postnotum black, nude. Abdomen black above; distinct narrow yellow lateral basal patches. Legs dark. Femora and tibiæ swollen apically. Wing scales dark elliptical. From Para.

Culex spissipes Theobald.

The type has traces of brown spots in the golden part of the disk. Our material from Surinam shows that these spots vary very much in size. *Culex fur* Dyar and Knab is a synonym.

Neomelanoconion chrysothorax Newstead and Thomas.

This species differs from *chrysonotum* by the broad white apices of its femora and tibiæ. The golden narrow curved scales of the mesonotum are more or less arranged in lines. The wing scales are intermediate between *spissipes* and *chrysonotum*. It seems to be a distinct species coming nearest to *chrysonotum* of which it has the size. The specimens were from Manaos.

Melanoconion indecorabile Theobald.

Can not be placed.

Culex humilis Theobald.

Can not be placed.

Trichopronomyia microannulata Theobald.

The genitalia place this species in *Culex factor* Dyar and Knab. The type is from British Guiana. In Surinam we found specimens of *Culex factor* with a tuft of hairs on the proboscis in the male. The adult of *microannulata* has two submedian impressed bare lines and a bent line above the roots of the wings, the four lines resembling the lyre of *Aedes argenteus*. The abdomen with very faint traces of banding dorsally, more distinct laterally.

Culex janitor Theobald.

The genitalia of the male type agree with Dyar's description (Ins. Ins. Mens., vi, 94, 1918).

Culex bilineatus Theobald.

The mount of the male genitalia of the male type shows it to be a true *Culex*. The basal lobe is undivided and has three rods, a filament, a leaf and a filament. The second uncal plate consists of three teeth as in *declarator*. The adults have a distinct thoracic ornamentation of dark bronzy brown and silvery golden narrow curved scales. The silvery golden scales are present on the anterior margin of the disk, continuing medianly for a short distance, a spot on the margin before and one at the root of the wing, and a spot more medianly between them and around the antescutellar space. Also on the scutellum. Two bare impressed lines on the mesonotum. Proboscis unbanded. Head with golden brown narrow curved scales, black erect ones and whitish scales on eye margins. Abdomen with basal lateral spots, unbanded or faintly dorsally banded in the female, distinctly in the male. Legs faintly and narrowly pale banded basally and apically on all the joints. It may be an ornamented form of *declarator*.

Culex virgultus Theobald.

Two males from Rio. The mount of the genitalia of the male type shows it to be a true *Culex*. The lobe of the side piece is as in *declarator* Dyar and Knab, also the equal plates. The adult has faint pale rings on the hind legs. We consider

it identical with *declarator*. It should be noted, however, that the dorsal bare lines are less distinct in the specimens of *virgultus* than in *declarator* from Surinam.

Culex microsquamosus Grabham.

The male type has no abdomen. There are three good mounts of three males from Dr. Grabham, Jamaica. All three *factor* Dyar and Knab.

Culex nigripalpus Theobald.

Originally described from a male from St. Lucia. This male has disappeared from the collection. Later Theobald mentioned a second male from Barbados. This male is in the collection and bears the type label. It is a specimen of *Culex factor* Dyar and Knab.

Microculex argenteoumbrosus Theobald.

This is identical with *Culex imitator* Theobald.

Genus PSOROPHORA Robineau-Desvoidy

Psorophora sayi Dyar and Knab.

Howard, Dyar and Knab consider *sayi* different from *posticatus* and describe *sayi* the North American species with a yellow venter and *posticatus* the Central and South American species with a yellow venter with basal violet bands. There is no difference in the genitalia. We think there is only one species, the name of which should be *posticatus* Wiedemann. The violet ventral bands of the abdomen are often very indistinct in South American specimens, and may even be absolutely absent as in specimens sent by Austen to the British Museum from the Lower Amazon.

Psorophora albipes Theobald.

We can confirm the identity with *Psorophora lutsi* Theobald.

Psorophora neoapicalis Theobald.

This is the South Brazilian form of *cingulatus* Fabricius. Male genitalia: Side pieces more than twice as long as wide, conically tapered, apical lobe prominent, triangular, basal lobe

absent; clasp filament stout, strongly swollen medianly, reticulate, a moderate terminal spine. Harpes flat, concave, one margin thickened, cleft at tip, forming two blunt teeth. Harpagones with a slender ligulate base and broad quadrate tip bearing five long hairs and a shorter one on elevated bases. Unci forming a cone.

Genus AËDES Meigen

Aëdes terreus Walker.

Culex terreus Walker, Ins. Saund., 429, 1856.

Stegomyia terreus Theobald, Mon. Culic., i, 305, 1901.

Culex terreus Theobald, Mon. Culic., i, 423, 1901.

Stegomyia terreus Theobald, Mon. Culic., v, 174, 1910.

The mount of the male genitalia of the male type shows it to be an *Aëdes*, falling in the *oswaldi* group. It differs from *oswaldi* in missing the long subapical seta on the harpago. The single type in the British Museum is much damaged but shows traces of white thoracic ornamentation as in *oswaldi*. The only mid leg left has a broad white band apically and basally on the first tarsal joint separated by a brown band; second tarsal joint with narrow basal band; femur with white streak beneath. Other legs missing or broken. Reported from South America.

Aëdes fluviatilis Lutz.

Danielsia mediomaculata Theobald is identical, and also *Danielsia tripunctata* Theobald. *Tripunctata* is described with white bands on both ends of the joints, but only on some of the joints there are a few pale scales at the apex, the bands are almost purely basal. *Fluviatilis* and also the male of *mediomaculata* sometimes have a few of these apical pale scales. The abdominal markings vary considerably in *fluviatilis*, the golden scales of the mesonotum of *tripunctata* could with equal right be called silvery.

Aëdes oswaldi Lutz.

There are four specimens of *Aëdes oswaldi* Lutz in the British Museum, from which Theobald made his description

of *Culicada fluviatilis*. So *Culicada fluviatilis* Theobald (Mon. Culic., iv, 342, 1907), is a synonym of *Aedes oswaldi* Lutz. *Gualteria fluviatilis* Peryassú is the old *Culex fluviatilis* Lutz and remains a synonym of this one. Theobald's type of *Culicada fluviatilis* had the mesonotum much rubbed and almost without scales.

Genus MEGARHINUS Robineau-Desvoidy

Megarhinus chrysocephalus Lutz.

Only a male is present with broken legs. Head covered with coppery golden scales, which are rather characteristic and not present in *solstitialis* Lutz, *violaceous* Wiedemann, or *purpureus* Theobald. *Trichopygus* Wiedemann has it a little in the same way and *chrysocephalus* may be a synonym of *trichopygus*.

Megarhinus fluminensis Neiva.

One male specimen. Identical with *trinidadensis* Dyar and Knab.

Megarhinus grandiosus Williston.

Described from Guerrero, Mexico. One female specimen present. Mid legs missing; Williston does not mention the mid legs and only describes a female, probably the same female, which we had under observation.

Front legs white on tips of first, all of second, third and fourth joint, fifth joint dark on one side, white with a few dark scales on the other. Hind legs with tip of third joint, all of fourth and fifth white, according to description, broken in the specimen.

Williston thought his specimen different from *rutila* Coquillett by the leg markings. The leg markings of *rutila* as described in Howard, Dyar and Knab differ a little from Coquillett's description. The white markings in the *grandiosus* specimen agree fairly well with *rutila* as described by Howard, Dyar and Knab.

The general color of the legs of *rutila* are given as dark blue; the specimen of *grandiosus*, however, has at least as much

yellow as blue, the tibiæ of the hind legs are golden yellow all round on their distal two thirds, except the tip, which is black, more extensively on one side; the yellow coloration cannot be overlooked and we consider for this reason *grandiosus* distinct from *rutila*.

Megarhinus longipes Theobald.

One single female, labeled: "Mexico, one of Walker's series unnamed." A careful examination shows that on one side a mid leg is stuck to the specimen in the position of a front leg of the same side. The legs show much yellow as in *grandiosus* Williston. The hind tibiæ are just the same. The first hind tarsal joint is more yellowish still than in *grandiosus*. The mid legs, which were absent in the *grandiosus* specimen, have the tibiæ and first tarsal joint nearly completely yellow, except the tip of the tibia.

The front legs which are darker than the others, show white on the tip of the first, all of the second, third and fourth joint, fifth joint dark on one side, white with a few dark scales on the other side as in *grandiosus*. The mid legs with tip of first, all of second and third joint white, rest missing. This is also like *grandiosus* where, according to the description, the mid legs were like the front legs. The hind legs of *longipes* were broken off after the first joint; according to the description the tip of the third joint was white, the last two joints were lost already. Then there was no difference with *grandiosus* in the hind legs.

We also can not find differences in the ornamentation of the head or body and make *longipes* Theobald a synonym of *grandiosus* Williston, 1900.

Genus **MANSONIA** Blanchard

Mansonia pseudotitillans Theobald.

This species is certainly different from *titillans* Walker. We also have several specimens from Surinam.

Mansonia amazonensis Theobald.

This has the front part of the mesonotum solidly covered

with golden brown scales. It has the size and the general color of *titillans*. We found a male amongst the material.

Genitalia: Side pieces about twice as long as wide, narrowed a little at the middle. Apical lobe present with an inner and an outer division, the inner division with moderately long hairs, outer division with long hairs and filaments, one of the filaments spatulate. Tip of basal lobe a stout rod, attenuated at the middle, with rounded tip on which a short terminal spine is inserted. A group of long hairs at the base of the side piece. Clasp filament very stout, distorted, tapering to tip, with a terminal spine and a long slender branch. Harpes small, toothed at tip. Unci a stout basal cylinder.

Mansonia arribalzagae Theobald.

Mansonia coticula Dyar and Knab seems to be a synonym of this species.

COMMENT ON THE PRECEDING PAPER

(*Diptera, Culicidæ*)

BY HARRISON G. DYAR

Mrs. Bonne-Wepster and Doctor Bonne are to be congratulated on the valuable work, the results of which appear in this paper. A few points of comment occur to me.

Genus PHONIOMYIA Theobald

This name is left in the air. The authors substitute *Dyarina* for *Phoniomyia* Dyar (not Theobald), but are unable to cite a male for *Phoniomyia* Theobald. One of Theobald's specimens is shown to be a *Dodecamyia*, but not the type. Not improbably this rubbed female type will prove to be a *Wyeomyia* or *Dendromyia*, and the name *Phoniomyia* can be dropped.

Wyeomyia grayii Theobald.

The authors state that the species has all the characters of *abebeia* D. & K. from southern Mexico. This presumably refers to the characters of coloration, and not to the genitalia.

It is not at all probable that a Mexican species of this group will prove the same as one from the Lesser Antilles.

Genus GOELDIA Theobald

Of the five species not placed in the table by Bonne-Wepster and Bonne, three are in the National Museum. *G. vonplesseni* D. & K. appears to be the same as *longipalpis* Theobald as restricted.

Goeldia vonplesseni Dyar & Knab.

Lesticocampa vonplesseni Dyar & Knab, Proc. Biol. Soc. Wash., xix, 137, 1906.

Hyloconops longipalpis Theobald, Mon. Culic., iv, 587, 1907.

The name *longipalpis* has been credited to Lutz (in Bourroul); but the species is not described there nor elsewhere by Lutz so far as I know. The first description is by Theobald (1907), and postdates *vonplesseni* D. & K.

Goeldia trichopus Dyar.

Lesticocampa trichopus Dyar, Ins. Ins. Mens., vii, 10, 1919.

Mid and hind tarsi marked with white; markings at the tips of the tarsi; second hind tarsal joint ciliate; proboscis as long as the abdomen; abdominal colors separated in a nearly straight line; scutellum with bright green scales.

Close to, if not the same as *G. frontosa* Theobald of the table. The metallic green scales exist also on the posterior portion of mesonotum. The published descriptions remain insufficient to decide the synonymy.

Goeldia espini Martini.

Lesticocampa espini Martini, Ins. Ins. Mens., ii, 65, 1914.

Trichoprosopon (Joblotia) stropshirei Ludlow, Psyche, xxvi, 168, 1920.

Tarsi all black; proboscis as long as the abdomen; abdominal colors incised; scutellum concolorous with mesonotum. It thus falls with *lunata* Theobald, differing as follows:

Large; venter and abdominal incisions golden...*lunata* Theobald
Small; venter and abdominal incisions silvery....*espini* Martini

Genus CULEX Linnaeus

The synonymy of the species of *Culex* proper is considerably upset. Using the numbers of my paper on this group (Ins. Ins. Mens., vi, 94-100, 1918), the following appears to be the result:

4 and 5. *Culex* (*Culex*) *nigripalpus* Theobald.

Culex nigripalpus Theobald, Mon. Culic., ii, 322, 1901.

Culex palus Theobald, Mon. Culic., iii, 194, 1903.

Culex factor Dyar & Knab, Jn. N. Y. Ent. Soc., xiv, 212, 1906.

Trichopronomyia microannulata Theobald, Mon. Culic., iv, 481, 1907.

Culex aikemii Dyar & Knab, Proc. U. S. Nat. Mus., xxxv, 61, 1908.

Culex proximus Dyar & Knab, Proc. Ent. Soc. Wash., xi, 38, 1909.

Culex lachrimans Dyar & Knab, Smith. Misc. Colls., Quart. Iss., lii, 259, 1909.

Culex caraibeus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. Ind., iii, 257, 1915.

Greater Antillean race, *similis* Theobald.

Culex similis Theobald, Mon. Culic., iii, 207, 1903.

Culex microsquamosus Grabham, Can. Ent., xxxvii, 407, 1905.

Culex regulator Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 213, 1906.

Culex carmodyae Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 210, 1906.

Culex prasinopleurus Martini, Ins. Ins. Mens., ii, 68, 1914.

8. *Culex* (*Culex*) *corniger* Theobald.

Culex corniger Theobald, Mon. Culic., iii, 173, 1903.

Culex lactator Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 209, 1906.

Culex hassardii Grabham, Can. Ent., xxxviii, 167, 1906.

Culex basilicus Dyar & Knab, Proc. Biol. Soc. Wash., xix, 169, 1906.

Culex subfuscus Theobald, Mon. Culic., iv, 403, 1907.

Culex lactator loquaculus Dyar & Knab, Smith. Misc. Colls., Quart. Iss., lii, 254, 1909.

Culex leucotclus McCormack, Panama Health Reports, 1918, 29, 1919.

16 and 17. *Culex* (*Culex*) *mollis* Dyar & Knab.

Culex carmodyae mollis Dyar & Knab, Proc. Biol. Soc. Wash., xix, 171, 1906.

Culex lateropunctata Theobald, Mon. Culic., iv, 458, 1907.

Culex equivocator Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 203, 1907.

Culex elocutilis Dyar & Knab, Smith. Misc. Colls., Quart. Iss., lii, 255, 1909.

Culex delys Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. Ind., iii, 317, 1915.

18. **Culex (Culex) virgultus** Theobald.

Culex virgultus Theobald, Mon. Culic., ii, 123, 1901.

Culex bilineatus Theobald, Mon. Culic., iii, 196, 1903.

Culex declarator Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 211, 1906.

Culex inquisitor Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 211, 1906.

Culex proclamator Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 211, 1906.

Culex jubillator Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 201, 1907.

Culex revelator Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 202, 1907.

Culex vindicator Dyar & Knab, Smith. Misc. Colls., Quart. Iss., lii, 255, 1909.

Culex dictator Dyar & Knab, Smith. Misc. Colls., Quart. Iss., lii, 255, 1909.

Culex virgultus was described from two males, of which the genitalia were examined. There can be no doubt that this is the earliest name for the species, the known distribution being extended to Brazil. *Culex bilineatus* was described from a female and a male, Theobald distinctly stating that the female has toothed claws. On this account, I referred the species to *Aedes*, and placed it tentatively in the *scapularis* group (Ins. Ins. Mens., viii, 105, 1920). Dr. and Mrs. Bonne find that the male is a *Culex*, and of the present species. If the female had been an *Aedes*, I am certain that their attention would have been attracted to the discrepancy. The only other explanation is that Theobald made a mistake, and should have described the claws of the female as simple. As this is by no means a violent assumption, I have arranged the synonymy on this basis. As further confirmation, it may be noted that Theobald says of the female *bilineatus*, "apex of abdomen

bristly," which would apply very well to a *Culex*, but certainly not to an *Aedes*.

27. ***Culex (Culex) inflictus* Theobald.**

Culex inflictus Theobald, Mon. Culic., ii, 115, 1901.

Culex scholasticus Theobald, Mon. Culic., ii, 120, 1901.

Culex extricator Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 211, 1906.

40. ***Culex (Micraëdes) corrigani* Dyar & Knab.**

Culex corrigani Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 203, 1907.

Culex chalcocorystes Martini, Ins. Ins. Mens., ii, 70, 1914.

The above synonymy may be mentioned, although not connected with the work here noticed.

55. ***Culex (Choeroporpa) theobaldi* Lutz.**

Melanoconion theobaldi Lutz, Imp. Med., Feb. 10, 1905.

Culex chrysonotum Dyar & Knab, Proc. U. S. Nat. Mus., xxxv, 57, 1908.

Genus PSOROPHORA Robineau-Desvoidy

The authors would sink *sayi* D. & K. as a synonym of *posticatus* Wied. An absolute synonym seems to overstate the case, and here is a good opportunity for the subspecific conception. The forms may be known as *Psorophora posticatus posticatus* Weid. and *Psorophora posticatus sayi* D. & K.

***Aedes (Taeniorhynchus) fluviatilis* Lutz.**

Culex fluviatilis Lutz in Bourroul, Mosq. do Brasil, 42, 72, 1904.

Danielsia mediomaculata Theobald, Mon. Culic., iv, 245, 1907.

Danielsia tripunctata Theobald, Mon. Culic., iv, 247, 1907.

Aedes lithoecetor Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 201, 1907.

Aedes zoösofhus Dyar & Knab, Ins. Ins. Mens., v, 165, 1918.

I cannot detect any difference in the types of *zoösofhus* from *fluviatilis*. The specimens came from the hilly region of central Texas, where there is opportunity for the streams to form pot-holes in the coral rock.

***Mansonia nigricans* Coquillett.**

Taeniorhynchus nigricans Coquillett, Proc. Ent. Soc. Wash., vi, 166, 1904.

Bancroftia persephassa Dyar & Knab, Smith. Misc. Colls., Quart. Iss., lii, 254, 1909.

This synonymy has not before been noted, and might as well be adduced here, as well as the following correction to my paper (Ins. Ins. Mens., vi, 112-115, 1918):

Mansonia justamansonia Chagas.

Taeniorhynchus justa mansonia Chagas, Nov. Esp. de Cul. Braz., 23, 1907.

Taeniorhynchus juxta-mansonia Peryassú, Os Culic. do Brazil, 223, 1908.

THE MALE OF PSOROPHORA COFFINI DYAR & KNAB

(Diptera, Culicidæ)

By HARRISON G. DYAR

This species, heretofore known only in specimens from the Bahamas, was bred in St. Thomas, Virgin Islands, by Dr. E. Peterson, from larvæ in pools following heavy rains. The male is now described.

Psorophora coffini Dyar & Knab.

Janthinosoma coffini Dyar & Knab, Proc. Biol. Soc. Wash., xix, 134, 1906.

Male. Coloration as in the female. Hypopygium. Side pieces about three times as long as wide, truncate at tip; clasper inserted at the outer angle, slender at base, the tip also small, greatly swollen mesially; a stout claw at tip. Claspette three-fourths as long as the side piece, stout, fused to the side piece for its basal half; outer part free, obliquely truncate, many setæ along the inner surface of the truncation, the tip narrow and bearing two broad distorted filaments, one S-shaped, the other hooked; also a similar but delicate curved filament at the end of the row of setæ. Tenth sternites normal. Aedoeagus small, conical. Two very stout spines represent the ninth tergites, without the usual basal enlargement. Posterior margin of the eighth segment with three very stout setæ on each side.

THE SWARMING OF *CULEX QUINQUEFASCIATUS* SAY

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

In the monograph (Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iii, 355, 1915) we quote Schwarz and Goeldi on the swarming of this species, but neither author says anything about the attraction of the males to the human person. In my experience it is pronounced, as much so as with *Aedes aegypti* or *Aedes varipalpus*. At Kerrville, Texas, the hotel had a double porch well shaded with lattice and vines. In the daytime, on the upper porch, males of *Aedes aegypti* swarmed about one who sat there for some time, and in the evening, on the lower porch, the same phenomenon was observed, only the species concerned was *Culex quinquefasciatus*. It was long after sunset, quite dark in fact, a small electric light was burning at the entrance to the porch. Sitting in a chair a little distance back from the light, after some time the male *Culex* began to gather, and continued swarming about head and shoulders in the dusk as long as one wished to stay.

RING-LEGGED *CULEX* IN TEXAS

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

The following species of the ring-legged or *tarsalis* group of *Culex* occur in Texas.

Culex (Culex) tarsalis Coquillett.

Culex tarsalis Coquillett, Can. Ent., xxviii, 43, 1896.

Culex willistoni Giles, Handb. Gn. or Mosq., 281, 1900.

Culex affinis Adams (not Stephens), Kans. Univ. Bull., ii, 25, 1903.

Culex kelloggii Theobald, Can. Ent., xxxv, 211, 1903.

Culex pcus Speiser, Insektenbörse, xxi, 148, 1904.

Undoubted specimens of this species are before me, proboscis, legs and mesonotum fully ornamented, Camp Travis, Texas, March 26, 1918 (D. L. Van Dine).

Culex (Culex) thriambus, new species.

Female. Proboscis black above, broadly whitish in the middle below, the white rarely nearly or wholly encircling the organ in a narrow ring. Mesonotum with brown scales. Abdomen with basal segmental white bands, widening on the sides; venter pale, with diffused black patches toward the posterior borders of the segments. Legs with the femora white below, femora and tibiæ lined with white on the inner side only, black without; tarsi narrowly and often indistinctly ringed with white at both ends of the joints. Wing-scales dark, narrow and hair-like.

Male. The proboscis has a complete white ring; otherwise the coloration is as in the female. Hypopygium. Side piece curved, conical at tip; subapical lobe with three rods, a leaf and a stout seta. Clasper smooth, wide at base, the spine appendiculate and shortly subapical. Tenth sternites with strongly spinose tip and curved basal arm, the latter enlarged at end. Mesosome with the inner process membranous and denticulate, central area with four teeth, outer process thumb-shaped. Ninth tergites undeveloped.

Larva. Head-hairs multiple; antennæ with the basal part with long spines, the notch at the outer third; lateral comb of the eighth segment of numerous scales in a patch; air-tube long and slender, slightly tapering on the outer half, about six times as long as wide; pecten of about 12 teeth on the basal third of the tube; hairs single, a long single one beyond the pecten and a short double subapical one are preserved, besides two single ones, one out of line just beyond the long hair mentioned, and another much more out of line beyond the middle of the tube. Possibly there should be four hairs in the posterior row instead of two as here described. These hairs are easily broken, the remaining insertions difficult to find. Anal segment broadly ringed by the plate.

Larvæ in a small dirty pool beside the river.

Types, one male and two females, No. 23926, U. S. Nat. Mus.; Kerrville, Texas, August 20, 1920 (H. G. Dyar).

Allied to *stigmatosoma* Dyar (= *eumimetes* D. & K.).

Culex (Culex) coronator Dyar & Knab.

Culex coronator Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 215, 1906.

Culex (Culex) usquatus Dyar, Ins. Ins. Mens., vi, 122, 1918.

Normal adults emerged from larvæ in a street excavation filled with rain-water, San Benito, Texas, August 21, 1920 (H. G. Dyar). The larvæ were lost in transit and did not come under minute observation.

The male hypopygium agrees with the normal *coronator* form, not as in the *usquatus* form, which has the setæ at the tip of the side-piece forming a distinct tuft.

THREE NEW MOSQUITOES FROM COSTA RICA

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

Culex (Choeroporpa) alfaroi, new species.

Occiput with flat black and white scales, which change in color with the incidence of the light; abdomen black above; legs black; wing scales black, those on the forks of the second vein outwardly narrowly ovate; mesonotum dark brown, the narrow curved scales inclining to golden.

Hypopygium. The shape of side piece and clasper cannot be made out in the mount. Outer division of lobe of side-piece narrowly columnar, widened and rather strongly furcate, the inner limb with a long hooked filament and a shorter similar filament with separate insertions; close to the outer limb, a large insertion bearing a rather large leaf, not quite as long as the setæ; on the limb beyond, a group of about four filaments closely placed. Inner division of the lobe of side piece with two long hooked filaments, close together and parallel, one inserted half way up on the side of the other. Mesosomal plate trifold, the upper horn short and pointed, the lower longer and notched; third point subapical, close to the others, long and sharp. Basal hooks broad, curved. Tenth sternites slender with comb-shaped tip, the base expanded, with a shoulder,

but without basal arm. Ninth tergites large at base, long, tapering and finger-shaped with a tuft of long hairs at the tip.

Type, male, No. 23938, U. S. Nat. Mus.; Atirro, Costa Rica, elevation 600 meters, October 24, 1920 (A. Alfaro).

The male type is much damaged and shows little that is characteristic in coloration; the structure of the hypopygium places it close to *tecmarsis* Dyar.

Culex (Choeroporpa) holoneus, new species.

Palpi, proboscis and legs black; mesonotum dark brown, the narrow curved scales slightly golden under the microscope; abdomen black, with narrow white basal segmental bands, widening on the sides; venter pale; the apices of the segments broadly dark. Wing scales rather broadly ovate on the forks of the second vein outwardly.

Hypopygium. Side piece swollen basally, the tip narrowed and conical, coarsely setose; an area of fine setæ on the inner aspect. Clasper attenuated centrally, the tip narrowly snout-shaped, excavate a little beneath, where there is a seta, and around which the median groove makes an arc; a short crest of pile on top; subterminal spine widened and appendiculate, unusually large. Outer division of the lobe of side piece with a slender inner arm, bearing a long hooked filament and a blade-like one; on the stem below the fork, a very large expanded leaf is inserted, the base and margins radially reinforced, the tip thin and indefinite; outer limb with a group of rather long appressed filaments; inner division of the lobe of side piece with the limbs divaricate and subequal, each bearing a long curved filament with expanded hooked tip; some minute pilosity in the angle between the two divisions of the lobe of side piece. Mesosome greatly reduced, apparently absent, in its place a pair of small pointed simple appendages, fimbriate on the inner side, the tip forming a retrose point. Tenth sternites comb-shaped, with about seven teeth, the basal shoulder produced into a thumb-like arm. Ninth tergites large, oblique, thick, conical, with fine setæ uniformly distributed, rather sparser at the tip.

Type, male, No. 23939, U. S. Nat. Mus.; Orotina, Costa Rica, elevation 300 meters, October 17, 1920 (A. Alfaro).

Aëdes (*Culiselsa*¹) *perichares*, new species.

Female. Head with narrow curved white scales on the vertex, succeeded by flat white ones, which reach the eye-margin, flat black ones below; bristles long; a few erect forked black scales on the nape. Tori nude, clypeus nude, a patch of white scales on first joint of antenna. Mesonotum with dense dark brown narrow curved scales, white along the anterior margin, cut by two black impressed lines, continued laterally, and curved inward as in *Aëdes aegypti*, except that the marking is diffuse and of a grayish silvery; white scales about antescutellar space and on scutellum. Abdomen black, with narrow lateral basal segmental white patches; venter with the segments white at base, black on the apical halves. Legs black, the femora narrowly whitish beneath at base; tarsi with narrow white rings at both ends of the joints, broader on the hind legs, the last hind tarsal all white. Wing-scales black, narrow and hair-like. Claws toothed.

Male hypopygium. Side pieces long and slender, conical, coarsely hairy, especially within; no apical lobe; basal lobe small, with many long setæ. Clasper with long blunt-ended spine. Claspette rather long, with a long seta just before its tip; filament slender and pointed, about as long as the stem. Tenth sternites long, slender, slightly hooked at tip. Aedoeagus conical, large. Ninth tergites undeveloped.

Described from nine males and five females, No. 23972, U. S. Nat. Mus.; Ciruelas, Costa Rica, elevation 800 meters, October 29, 1920, from larvæ in stone holes (A. Alfaro).

Nearest to *fluviatilis* Lutz, but the white tarsal rings on both ends of the joints.

¹ To replace *Taeniorhynchus* as used by me, following the monograph, to avoid the confusion caused by the use of *Taeniorhynchus* in the sense of *Mansonia*, as employed by Theobald, Edwards and others.

NOTES ON THE NORTH AMERICAN SPECIES OF
CHOEROPORPA

(Diptera, Culicidæ)

BY HARRISON G. DYAR

Since my last account (Ins. Ins. Mens., viii, 54-81, 1920), some matter worthy of record has transpired.

Culex (Choeroporpa) erraticus Dyar & Knab.

Melanoconion atratus Dyar (not Theobald), Journ. N. Y. Ent. Soc., xiii, 26, 29, 1905.

Mochlostyrax erraticus Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 224, 1906.

Culex abominator Dyar & Knab, Smiths. Misc. Colls., Quart. Iss., lii, 257, 1909.

Culex (Melanoconion) erraticus Dyar & Knab, Ins. Ins. Mens., v, 179, 1917.

Culex (Choeroporpa) erraticus Dyar, Ins. Ins. Mens., vi, 104, 1918.

Culex (Choeroporpa) erraticus Dyar, Ins. Ins., Mens., viii, 55, 1920.

This species was described from the larva, Baton Rouge, Louisiana. The mesonotum of the adult is commonly much marked with bright golden; but a specimen from the type locality (J. W. Dupree) is much abraded. The types of *abominator* were said to be ten, including five localities. There are seven specimens in the Como series, though but six are called for, leaving one specimen each for the other localities. The Como specimens have very little golden on the mesonotum and the abdomen is without the characteristic spottings, and I think they are probably not *erraticus*; they are at least doubtful, and may be excluded from the types. The remaining types are much worn, the golden color obscured.

Positive records exist from Louisiana, Arkansas, Mississippi and Tennessee; the Florida record has not been confirmed by male. It is doubtful, for the specimen has no gold on the mesonotum. I would refer it to *egberti* D. & K.

Culex (Choeroporpa) pose Dyar & Knab.

Culex (Mochlostyrax) pose Dyar & Knab, Ins. Ins. Mens., v, 182, 1917.

C[ulex] spissipes Dohanian (not Theobald), Journ. Econ. Ent., xiii, 352, 1920.

C[ulex] chrysonotum Dohanian (not Dyar & Knab), Journ. Econ. Ent., xiii, 352, 1920.

This may be a bright fresh specimen of *Culex erraticus* D. & K., but that cannot be decided until the male is at hand. It seems to be well distributed in the limestone region of Texas.

Mr. Dohanian's names, said to have been obtained from the Army Medical Museum, are obvious misidentifications of this species.

Culex (Choeroporpa) egberti Dyar & Knab.

Culex egberti Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 214, 1907.

Culex (Mochlostyrax) egberti Dyar & Knab. Ins. Ins. Mens., v, 180, 1917.

The types are three females. The mesonotum is dark brown, not golden, the abdomen with a row of little white spots dorsally. Without males it is impossible to say whether this is a good species, an unadorned form of *erraticus*, or *peccator*, or *peribleptus*. I do not think now that it is a *Mochlostyrax*, but probably a *Choeroporpa*.

Culex (Choeroporpa) peccator Dyar & Knab.

Culex peccator Dyar & Knab, Smiths. Misc. Colls., Quart. Iss., lii, 256, 1909.

Culex incriminator Dyar & Knab, Smiths. Misc. Colls., Quart. Iss., lii, 257, 1909.

Culex (Melanocomion) peccator Dyar & Knab, Ins. Ins. Mens., v, 179, 1917.

Culex (Choeroporpa) peccator Dyar, Ins. Ins. Mens., vi, 104, 1918.

Culex peccator Dyar & Barret, Ins. Ins. Mens., vi, 119, 1918.

Culex (Choeroporpa) peccator Dyar, Ins. Ins. Mens., viii, 56, 1920.

The type series of both *peccator* and *incriminator* contain males, making the synonymy certain. Positive records are at hand from Arkansas, Mississippi and North Carolina, and probable ones from Georgia, South Carolina and Tennessee. The distribution, therefore, overlaps that of *erraticus*, to which this is very closely allied. Besides the differences in the male

structures, the mesonotum has little or no golden and the abdomen is generally immaculate dorsally.

Culex (Choeroporpa) anips Dyar.

There is no synonymy to add to the last account (Ins. Ins. Mens., viii, 54, 1920), the species being still known only by the male and female types from San Diego, California.

Culex (Choeroporpa) peribleptus Dyar & Knab.

There is no synonymy to add to the last account (Ins. Ins. Mens., viii, 67, 1920). The species is known from Mississippi and South Carolina, thus overlapping both *erraticus* and *peccator*. It is, however, not closely allied, as the male genitalia are of a different type, one commonly represented in the American tropics, but except for this species and the following, unknown in North America. The adult is indistinguishable from *peccator* in coloration.

Culex (Choeroporpa) degustator, new species.

Head with flat black or white scales on the nape (changing in color with the incidence of the light), a very small patch of narrow curved yellowish ones centrally. Mesonotum with dark brown or golden brown dense scales. Abdomen black above, with small lateral segmental basal triangular white spots; venter pale, distinctly banded with black at the apices of the segments. Legs bronzy black, the femora white below. Wing scales black, dense and narrowly ovate toward the apex of the wing.

The palpi of the male are pointed, exceeding the proboscis by nearly the length of the last two joints, slightly pale at the base of the second joint.

Hypopygium. Essentially as in *peribleptus*; but the spine on the tip of the clasper is included, or does not exceed the end of the clasper; the articulated plate of the mesosome is deeply cleft, being furcate, one limb short, the other long and narrow; the ninth tergites are narrower, smaller, and obliquely approximated.

Types, two males, No. 23833, U. S. Nat. Mus.; Scott, Arkansas, August 11, 1909 (J. K. Thibault); Herrin, Illinois, August 27, 1920 (S. C. Chandler).

NEW AMERICAN NOCTUIDÆ AND NOTES

(Lepidoptera)

By HARRISON G. DYAR

Subfamily CUCULLIINÆ

Pleromella, new genus.

Tegulæ not produced behind into a hood; frons smooth; fore tibiæ with a long claw at tip, without accompanying plate; thorax clothed entirely with hair; palpi short, porrect, not exceeding the frontal hairs; eyes large, round; proboscis fully developed; male antennæ rather lengthily bipectinated to within ten joints of the tip; female antennæ shortly biserrate.

Pleromella opter, new species.

Male. Fore wing light gray, verging on whitish; costa and inner margin darker; veins lined with black; inner line narrow, black, forming a long but indistinct tooth in cell, another more distinct on submedian fold, broken at the tip, and a rounded one below vein 1, which is followed by a black shade; a whitish streak along submedian outwardly; stigmata obsolete; outer line straight and oblique, from apex to middle of inner margin, blackish, shaded, followed by white only below, intensified on the veins; small terminal dots between the veins; fringe gray, not lined. Hind wing whitish, translucent, veins at apex and termen touched with gray. Expanse, 34 mm.

Female. Somewhat darker gray, the markings less contrasted; outer line broader, fainter and less spotted on the veins.

Types, one male and two females, No. 23849, U. S. Nat. Mus.; male, Eldridge, California, May 14, 1915 (collection Jacob Doll); female, Placer County, California (E. C. Van Dyke), this specimen deposited in the Brooklyn Institute of Arts and Sciences; female, Colfax, Placer County, California, May, 1905 (gift of Dr. H. G. Dyar).

Rhizotype peralta Barnes.

Papaipema peralta Barnes, Can. Ent., xxxix, 14, 1907.

Dryobota peralto Barnes & McDunnough, Cont. Nat. Hist. Lep. N. A., i, No. 4, 7, 1912.

Pseudanarta peralto Barnes & McDunnough, Check List Lep. Bor. Am., 57, No. 2095, 1917.

This species is allied to the three Mexican species described by me, *cristifer*, *senescens* and *nudor*, especially to the former; but there are certain differences in detail. In *cristifer* the stigmata are darker than the ground-color and tend to be confluent, which is not the case in *peralta*.

***Pseudanarta actura ate*, new subspecies.**

Fore wing dark gray, more blackish through the median space; lines obsolete, the outer traceable, whitish, excurved over cell, pointed on vein 1; reniform diffused, whitish, the pale area running to costa; a whitish blotch above tornus; a broken black terminal line. Hind wing dark yellow, with moderate even outer black border, repeated beneath, the costa there dark gray shaded, but without trace of discal marking; fringe white. Expanse, 25 mm.

Type, male, No. 23850, U. S. Nat. Mus.; Loma Linda, San Bernardino County, California (through J. Doll).

Pseudanarta actura Smith is not before me, but from the description, I judge the present to be a local form of it.

Subfamily AGROTINÆ

***Schinia melliflua*, new species.**

Fore wing with a broad white costal band, not quite reaching apex; rest of wing shaded with dull clay-color; a broad dull rosy shade from base, forming a point centrally and followed by whitish, the remains of the inner line; outer line similar, faint, whitish, out-bent above; subterminal space filled in with dull rosy; a dark cloud at end of cell. Hind wing white, shaded with blackish outwardly on the veins and discal cross-vein; beneath white, a red mark at end of submedian fold. The fore wing is marked with the same red from the end of the cell to subterminal line, diffusely streaked on the veins. Expanse, 28 mm.

Type, female, No. 23851, U. S. Nat. Mus.; Palm Springs, California, April 20, 1916 (V. L. Clémence).

Subfamily ACRONYCTINÆ

Stibadium astigmatosum, new species.

Fore wing dark gray, finely powdered with white scales, the terminal area beyond the outer line to apex appearing dilute and paler; inner line very fine, white, indistinct, angled on submedian fold; outer line oblique, sharply angled at vein 5, running back to costa; orbicular and reniform finely outlined in white, a very little darker than the ground; subterminal line fine, white, powdery, parallel to the margin; a white line at base of fringe. Hind wing white, a little powdered with gray outwardly; a dark terminal line; base of fringe white. Expanse, 22 mm.

Type, male, No. 23929, U. S. Nat. Mus.; southern Arizona, August, without exact locality (O. C. Poling).

Emarginea percara Morrison.

Bryophila percara Morrison, Proc. Bost. Soc. Nat. Hist., xvii, 213, 1874.

Cyathissa quadrate Smith, Can. Ent., xxxviii, 225, 1906.

Cyathissa ochracea Smith, Can. Ent., xxxviii, 225, 1906.

The name *quadrate* Smith is evidently based on specimens in which the green color of the fore wing had been discolored. This green commonly turns to orange if wet in the relaxing jar. My specimens show all grades, and it is only those that have been most carefully handled that retain the green completely. The name *ochracea* may stand as a variety in which the black shadings in the medial area are reduced. Smith's specimens were evidently discolored as with *quadrate*, hence the misleading name. The variety appears occasionally among normal specimens.

Emarginea dulcinia, new species.

Fore wing white, shaded with olivaceous green; a black angular expanded mark at base, and two on costa; inner line black, broken in the middle, excurved in the cell and below vein 1; upper half of median space shaded with black, containing a large trilobed white patch, resting on costa, and containing a small costal black spot; outer line dentate, broad-

ened within above and below, the longest dentations on veins 3 and 4; fringe black and white spotted. Hind wing whitish, with traces of dusky median line, excurved over cell. Expanse, 18 mm.

Types, two males, No. 23930, U. S. Nat. Mus.; Washington Mountains, Arizona, date and collector missing (gift of B. Preston Clark).

Like *pallida* Smith, this species has no dark tornal mark beyond the outer line.

Subfamily EUTELIINÆ

Marathyssa inficita minus, new subspecies.

Similar to *inficita inficita* Walker; smaller, the pale markings in reniform, median space and tornus much more prominent, whitish. Expanse, male 18–21 mm.; female, 21–22 mm.

Types, six males, three females, No. 23945, U. S. Nat. Mus.; Sabinal, Texas, March and May, 1910 (F. C. Pratt); Baboquavaria Mountains, Arizona, July 15–30, 1903 (O. C. Poling); southern Arizona, July and August (O. C. Poling); Oracle, Arizona, July 12, 1898 (E. A. Schwarz).

Subfamily NOCTUINÆ

Psammathodoxa, new genus.

Palpi obliquely upturned, exceeding vertex, the last joint small; tongue moderately well developed; eyes large, round; legs without special armature; vestiture, prothorax with high central quadrate tuft; abdomen with a tuft on basal segment. Fore wing with areole. Antennæ of male with long pectinations.

Psammathodoxa cochliidioides, new species.

Fore wing creamy brown, shaded darker except along costa and basally; wing crossed by about 14 light lines, irregularly waved, giving an irrorated appearance; a straight pale line, brown-edged within from apex to middle of inner margin; fringe concolorous. Hind wing brown, the fringe much paler. Expanse, 25 mm.

Type, male, No. 23852, U. S. Nat. Mus.; Brownsville, Texas

(J. Doll), presented to the National Museum by the Brooklyn Institute of Arts and Sciences.

Phiprosopus ergodan, new species.

Male antennæ serrate and with short bristles, about the length of the antennal width. Fore wing dark brown, the lines pale and powdery, inner faint, outer running nearly to apex, then sharply reflexed to costa and single; main part of outer line broad, pale, with central brown line; wing powdered with white atoms, the terminal area having a reticulated look. Hind wing whitish, with little yellow tint, the margin narrowly stained with brown. Expanse, 30 mm.

Type, male, No. 23853, U. S. Nat. Mus.; Cayuga, Guatemala, May (Schaus & Barnes).

Similar to the North American *callitrichoides* Grote, but the antennal bristles much shorter.

Phiprosopus pardan, new species.

Fore wing brown, shaded with whitish, base and median space shaded with warm reddish; inner line whitish, sharply angled subcostally; outer line broader, with central brown line, faintly continued to apex, but mainly sharply reflexed and arcuate to costa; subterminal line pale, wavy; a row of black points before margin, surrounded by white powdering. Hind wing dull yellowish, shaded with brown beyond the middle; fringe of both wings dark brown with pale basal line. Expanse, male, 28 mm.; female, 32 mm.

Types, male and female, No. 23854, U. S. Nat. Mus.; Santiago, Cuba, June, 1902 (W. Schaus).

Similar to the preceding, but with dark hind wings; the bristles of the male antennæ are long.

Phiprosopus intertribulus, new species.

Male antennæ without serrations, the bristles long and very fine. Fore wing bronzy golden over yellowish, darker through the median area, except at costa; a narrow lighter bar at end of cell; a nearly straight outer line from apex to middle of outer margin, only a faint trace of the reflexed line showing at costal edge; the wing has an irrorated, reticulate appearance.

Hind wing creamy brown at base, broadly dark brown outwardly, the fringe paler. Expanse, 31 mm.

The female is without the golden shading, the reflexed part of outer line distinct; centrally brown, base, terminal area and the area above the reflexed line gray, paler. Hind wing as in the male.

Types, male and female, No. 23855, U. S. Nat. Mus.; Santiago, Cuba, January, 1903 (W. Schaus).

Arbostola Druce.

Druce described *Arbostola* (?) *viridis* (Ann. Mag. Nat. Hist. (7), v, 519, 1900). It is probable that the generic name is a clerical error for *Abrostola* Ochsenheimer; but the present species falls in a different subfamily, and the spelling is sufficiently different not to cause confusion. The genus, as founded on the type species, *viridis* Druce, falls in the Noctuinae. On the hind wings, veins 3 and 4 are connate from a point of the cell, 5 arising shortly above; fore wing with a long areole, vein 11 from the cell; palpi sharply upturned, reaching shortly above vertex, the last joint about half as long as the second, pointed; femora and tibiae clothed with long red hair in both sexes; antennae simple; vestiture of hair and hair-like scales, erect on tegulae and prothorax, forming a distinct tuft on metathorax; abdomen with rough hair at base, but not tufted.

Arbostola heuritica, new species.

In *viridis* Druce the wings of the male are normal below; in the present species they are roughened with erect scales on the tips of both wings, ochereous outwardly. In the male the hind wings are white above, female with dark veins and fuscous shaded outwardly. Fore wing much as in *viridis*, except that in the male the green color is confined to the area along the inner margin, and in the female, it occupies the whole of the terminal space also, up to the outer line.

Types, male and female, No. 23856, U. S. Nat. Mus.; Pernambuco, Brazil (Schaus collection). Also a second male with the same data, and a third male, Benito Province, Pernambuco, Brazil (A. Koebele).

TWO NEW AMERICAN MOSQUITOES

(Diptera, Culicidæ)

BY HARRISON G. DYAR AND C. S. LUDLOW

***Culex (Melanoconion) homoeopas*, new species.**

Male. Proboscis black, the palpi exceeding it by nearly the length of the last two joints, which are sparsely hairy, sharply pointed. Vertex of head with dense flat black scales, the tips a little bronzy, whitish along the margins of the eyes in an even border. Mesonotum dark brown, with narrow curved golden scales, mixed with brown ones about the antescutellar space and on the sides. Abdominal integument testaceous, the scales black, the first four segments wholly black above and below, the fifth with a pale triangular basal yellowish spot and a narrow transverse pale line on the venter close to its base. Legs black, the femora pale beneath; tips of femora and tibiæ narrowly pale. Wing-scales black, ligulate, becoming narrowly ovate on the forks of the second vein.

Hypopygium. Side piece curved, slightly swollen mesially, finely setose, with coarse setæ without. Clasper simple, bent at right angles in the middle (which may be an artifact), the terminal half slightly enlarged and flattened; spine subapical, appendiculate, slender. Outer division of the lobe of side piece slenderly columnar, with three broadly blade-shaped filaments and a small leaf radiating from its summit. Inner division of the lobe with the limbs well separated, the outer long, the inner short, each with a long stout sinuate filament with flattened pointed tip; a radial pecten between the inner and outer divisions of the lobe. Mesosomal plate thick, bent in the middle, tapering to a point; a thorn-like branch at the angulation, formed much as in *Culex (Micraëdes) corrigani* D. & K. (Ins. Ins. Mens., vi, plate iv, fig. 15, 1918), but the branch is pointed; articulated plate broadly spatulate, one limb more expanded than the other; basal hooks broad, recurved, expanded on one side by a wide thin membrane; tenth sternites slender, comb-shaped, narrowly expanded at base, but without shoulder or basal arm. Ninth tergites moderate, elliptical, oblique, densely setose except along the inner margin.

Type, male, No. 23942, U. S. Nat. Mus.; Jackson Barracks, New Orleans, Louisiana, October 16, 1920 (Colonel C. C. Robbins, Medical Corps, U. S. Army).

It is possible that this single male may have been transported on a fruit steamer from Bluefields, Nicaragua. It is not allied to any known North American form, belonging to a subgenus found in the American tropics.

The following table will separate the described species of *Melanoconion* on the characters of the male hypopygium.

Subgenus MELANOCONION Theobald

Melanoconion Theobald, Mon. Culic., iii, 238, 1903.

Gnophodeomyia Theobald, Journ. Econ. Biol., i, 21, 1905.

1. Outer division of lobe of side-piece with a small leaf and several setae2
This part with a large ribbed leaf and not more than one appendage3
2. Inner division of lobe of side piece with a short spine at tip and smaller one on the side.....*atratus* Theobald
This part with two long sinuate filaments, *homoeopas* Dyar & Ludlow
3. Inner division of lobe of side piece with four appendages.....4
This part with two appendages.....5
4. A short stemmed scale beyond lobe of side-piece..*spissipes* Theobald
Without this structure.....*dunni* Dyar
5. Leaf stemmed, with one large appendage.....*aikenii* Aiken
Leaf sessile, the appendage setaform.....6
6. Inner division of lobe of side piece with two large appendages,
zeteci Dyar
This part with one large and one setaform appendage.....7
7. Side-piece narrowed outwardly; a large stemmed scale inserted beyond the lobe.....*commevynensis* Bonne-Wepster & Bonne
Side-piece conical; no stemmed scale,
ensiformis Bonne-Wepster & Bonne

Culex (*Choeroporpa*) *dysmathes*, new species.

Female. Head very dark brown or black, clothed with very narrow dark brown and golden brown or ochraceous curved scales, black forked scales, and greyish-white flat scales. The dark curved scales cover the median third of the head, extending to the vertex; the black forked scales are scattered around this area; the greyish white flat scales are laterad, and, becom-

ing a little ovate, extend around the margin of the eyes, while straight across the head is a waving, uncertain line of the golden scales. Caudad to this are black curved and a few black forked scales. The occiput is often quite naked and shows the black integument. All the curved scales are very closely appressed, so as to seem unusually straight, and there is a tendency to bright golden reflection in some of the dark curved scales, so that under the compound microscope the bright golden line extends indefinitely, sometimes even to the vertex, leaving two sub-median dark oval spots, but under the hand lens there is merely an uncertain wavy line across the head. There are some black bristles around the eyes. The antennæ are brown, verticels and pubescence brown, the internodes with unusually long hairs, sometimes nearly as long as the verticels; proboscis black, swollen on the apical third, which has many short hairs, labellæ a little lighter, also hairy; palpi short, about one-sixth the length of the proboscis, and with many short hairs near and at the apex; clypeus black, median portion nude, apical and lateral portions with fine white pruinosity approaching a tomentum; eyes black.

Thorax: prothoracic lobes brown, well separated, sparsely covered with black bristles. Mesonotum shows a dark brown integument with a slightly paler broad median stripe, covered with small narrow, almost hair-like brown curved scales and heavy black bristles on the margin, at the wing-joints, and on either side of the ante-scutellar space; scutellum brown, markedly trilobed, covered with small slender brown curved scales like those on the mesonotum, black bristles on each lobe; metanotum dark brown, nude, shining; pleura light greenish brown with a few brown bristles.

Abdomen truncate and hairy at the apex, entirely dark brown scaled and except for very small dirty white basal lateral spots on the third, fourth, fifth and sixth segments, that on the fifth segment being the largest, but all are very small. Venter mostly dark-scaled, but some specimens show tiny white basal spots on a few of the segments. In considering the marking, it is to be remembered that the specimens are

bred, and in some cases poorly developed and the markings not well shown.

Legs; coxæ and trochanters greenish, having a few brown scales and bristles; femora are somewhat swollen, and light ventrally practically to the apex, otherwise the legs are brown; ungues simple and equal.

Wing membrane slightly darkened, the veins heavily clothed with dark brown clavate scales, especially noticeable on the forks of the second and fourth long veins. The first submarginal cell is comparatively long, much longer (more than three times) than its petiole, and about as wide as the second posterior cell, the stem of which is not quite half as long as the cell; posterior cross-vein is more than twice its length distant from the mid cross-vein. Halteres have white stems and dark knobs.

Length, 3–3.5 mm.; wing, 3 mm.

Male. Proboscis dark, somewhat swollen as in the female; palpi brown, longer than the proboscis by nearly the two apical joints, which are a little lighter than the more proximal joints, acuminate, and sparsely hairy, the plumes having light reflections so as to appear almost fawn colored. The antennæ are plumose, light between the nodes, the verticels dark, distal joints slender, very hairy. General coloration as in the female; wing cells shorter; ungues unequal, the larger uniserrate.

There is also a single male differing in markings in that it is more definitely black and white instead of brown and grayish, and the abdominal spots are clear white and extend on the dorsum so as to form almost continuous bands, very narrow, sometimes lacking on the median portion, and broadening toward the lateral spots. The description cannot be made more definite because in removing the apical segments, the abdomen was broken off. Apparently the insect is a little longer than the other male, about 4 mm. The differences seem small, but in the hand, and under the hand lens were sufficient to lead to the suspicion that we were dealing with another species.

Hypopygium. Side piece enlarged basally, tapering to a small conical tip. Clasper attenuated mesially, rather narrowly

snout-shaped, pilose on the anterior dorsal margin; a seta below; mesial groove curved over it; spine appendiculate, widened, subterminal, rather large. Outer division of the lobe of side piece with a short inner arm, bearing a long stout filament with hooked tip, and a short blade-like one; a large ribbed leaf inserted on the stem towards the base and rather on the inner side; middle filament blade-like, close to the outer group of widened filaments, which exceed the leaf. Inner division of the lobe of side piece with the arms well separated, the inner about half as long as the outer, each bearing a stout sinuate filament with flattened pointed tip. Paramere curved to a pointed tip, distinct, bearing the articulated plate toward its base; mesosomal plate with a point on one side, not emarginate or furcate, the other angle widely rounded and finely denticulate; articulated plate elliptical, strongly emarginate at the tip on one side; basal hooks moderate, curled, broad. Tenth sternites slender, with comb-shaped tip of about seven teeth; a small shoulder at base. Ninth tergites triangularly elliptical, with broad base, obliquely directed, densely and rather shortly setose.

The structure is allied to *Culex* (*Choeroporpa*) *holoneus* Dyar, but the reduction of the mesosomal plate has not proceeded so far as in that species.

Types, five males and nine females; two males and four females in the National Museum, No. 23943, U. S. Nat. Mus., three males and five females in the Army Medical Museum; Cativa, Canal Zone, Panama, October 19, 1920 (J. B. Stropshire).

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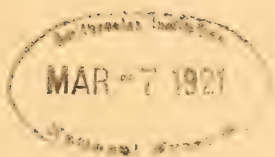
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A NEW MOSQUITO FROM EAST AFRICA

(Diptera, Culicidæ)

By HARRISON G. DYAR

Aedes (*Ecculex*) *rhecter*, new species.

Falls by Edwards's tables, both the earlier one (Bull. Ent. Res., ii, 247, 1911) and the later one (Bull. Ent. Res., iii, 15, 1912) to *Ochlerotatus quasiunivittatus* Theob., and agrees with

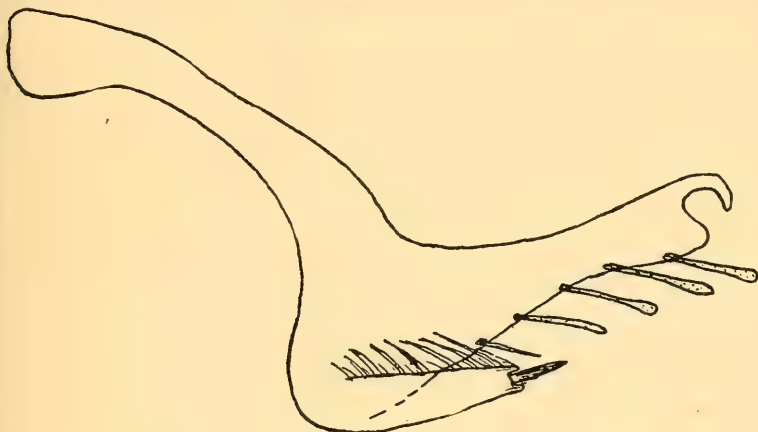


FIG. 1.—*Aedes rhecter* Dyar, new species.

the description of that species (Mon. Culic., ii, 32, 1901) and of its synonym *Culiciomyia dalzieli* Theob. (Mon. Culic., v, 234, 1910). The male genitalic differences in the allied forms were referred to by Edwards (Bull. Ent. Res., iv, 49, 1913), and later figured (Bull. Ent. Res., v, 277, 1915). The clasper of the present form is extremely different from that of *quasiunivittatus* (Edwards's fig. a) and also from the allied *dentatus* (Edwards's fig. b), although in a general way allied to both. A sketch of the structure is given herewith (fig. 1). The tip

of the clasper is prolonged as in the allied forms, the tip forming a distinct hook; the setæ are concentrated along the terminal margin, very stout and spatulate; the limb bearing the spine is bent down, its inner margin reversely fimbriate.

Types, No. 23928, U. S. Nat. Mus.; one male and four females, Lomagundi, November, 1909, one female, Lorenzo Marquez, Portuguese East Africa, November 7, 1909 (C. W. Howard).

These species, placed in *Ochlerotatus* by Edwards, are allied to *vexans* Meig., and with it fall in the subgenus *Ecculex* Felt. The type of *Ochlerotatus* being *confirmatus* L. A. (= *scapularis* Rond.), it is the same as *Heteronycha* as used by me.

NEW SPECIES OF HETEROCERA FROM SOUTH AMERICA

(*Lepidoptera*)

By WILLIAM SCHAUS

Family PHALAENOIDIDÆ

Diamuna grandimacula, new species.

Male.—Palpi and head dark reddish brown. Collar and thorax chestnut brown, the patagia tipped with fuscous. Abdomen above fuscous brown, the anal segment fuscous gray; a dorsal chestnut brown tuft at base; abdomen below similar with long sublateral tufts. Fore tibiæ and base of tarsi with long dark brown and black tufts; mid and hind femora with orange brown hairs, the tibiæ brown and fuscous, the tarsi black. Fore wings dark purple tinged with brown; a fine black streak through cell to postmedial line; a triangular dark reddish brown velvety spot antemedially below cell, its base resting on median vein followed at cell by some pale reddish brown shading and a dark vertical streak; a fuscous streak at base of inner margin followed by lighter shading; a dull brown streak on costal margin; faint indications of an oval spot on costa, followed by some lilacine irrorations; post-medial line remote, brown black, outcurved from costa to vein 4, then

slightly incurved to inner margin, outwardly edged with cinnamon brown and closely followed by a subterminal dark reddish line interrupted from vein 4 to below vein 6; a reddish brown streak from subterminal to apex below costa; termen irrorated with lilacine; cilia brown. Hind wings black; a large yellow spot before termen, inbent narrowly along costal margin to base, its inner edge straight from upper angle of cell to vein 2 near termen, its outer edge rounded. Fore wings below black; a ridge of velvety black upturned hairs along inner margin, which is narrowly yellow; a post-medial orange spot from costa to vein 2, its inner edge straight, its outer edge rounded. Hind wings below black; the orange spot slightly narrower and only reaching a little beyond middle of costal margin.

Expanse, 48 mm.

Habitat.—Joinville, Southeast Brazil.

Type.—Cat. No. 23974, U. S. Nat. Mus.

Family SATURNIDÆ

Arsenura crenulata, new species.

Male.—Head and palpi fuscous brown, a white line on vertex between antennæ. Collar and thorax dark brown. Abdomen gray. Thorax below and legs fuscous gray, the tarsi whitish yellow with brown rings. Fore wings dull grayish brown; costal space to post-medial grayish, almost white on costal edge, post-medial line slightly darker than ground color, down-curved and inbent to inner margin at base; a pale spot on discocellular faintly edged with brown which extends to costa on proximal side; a triangular grayish brown shade on inner margin from near base to middle; subterminal line outangled below costa, then incurved and wavy to inner margin, grayish with a white streak on costa, points at veins and a triangular white spot above inner margin, followed by a gray shade, lunular on vein 6 edged by a white line, indentate on vein 7 and with a black point on costa. Hind wings dull grayish brown; a post-medial dark line; subterminal line pale marked by white points on veins from vein 5 to inner margin, followed by a narrow dark gray shade crossed by a fine line

formed of lilacine white irrorations, its outer edge lunular or dentate. Wings below lilacine gray on basal half, the outer half darker gray, with some dark striæ, the two shades separated by a pale brown, lunular dentate narrow shade; a subterminal wavy fine dark gray line edged with whitish scales, preceded by paired fuscous shades at veins, and followed by small reddish brown spots at veins; discocellular spots black, containing some ochreous scales, the spot on forewing small, the spot on hind wing a little larger and round.

Expanse, male 130 mm., female 140 mm.

Habitat.—Balzabamba, Ecuador.

Type.—Cat. No. 23975, U. S. Nat. Mus.

Very similar to *Arsenura arcaei* Druce; the hind wings crenulate as in *Arsenura batēsi* Felder.

Received from Prof. Edward T. Owen.

Arsenura oweni, new species.

Male.—Head and palpi fuscous brown; a whitish shade around base of antennæ which are yellowish. Collar and thorax grayish brown, the former darker shaded in front. Abdomen above and below a little darker; lateral yellow points. Thorax below and legs fuscous brown. Fore wings light brown; costal margin to post-medial line and cell to ante-medial shade whitish thinly mottled with brown scales; ante-medial shade broad, dark brown but faint on costa, outangled below vein 2; post-medial line fuscous brown, faintly incurved, suffusing and followed by a broad dark chestnut brown shade widest toward costa; subterminal line fine, dark gray, outcurved below costa to vein 6, then diffuse, wavy, broader, below vein 2 straight and inbent to inner margin, preceded by a grayish brown shade, followed between veins 6 and 4 by small grayish lunules, and below 4 by a wavy line forming lunules between veins 4 and 2, below vein 2 parallel with post-medial marked with some small black spots and with a faint whitish shade between the two lines; some broad ochreous shading follows the lunules on interspaces; above vein 6 the post-medial is followed by a narrow light brown shade; a fine white streak and a gray shade edged by a fine white line,

deeply indentate on vein 7, starting from a small black spot on costa; a dark red line inbent from vein 7 to below vein 5; a long narrow brown spot on discocellular. Hind wings brown; costal margin whitish expanding to post-medial shade; a long vertical fuscous brown line from upper angle of cell to below lower angle; post-medial shade fuscous brown incurved from costa and almost straight to inner margin at subterminal line, followed by a broad dark grayish brown shade; subterminal line grayish brown nearly vertical to below vein 4, then inbent, wavy to inner margin, crossing a whitish shade and followed by a black lunular shade. Fore wings below lilacine gray irrorated with dark brown; cell and costa to above discocellular dark grayish brown; a fuscous line on discocellular; post-medial line fine fuscous brown; inner margin whitish; termen brown; black spots above tornus. Hind wings below lilacine gray thickly irrorated with brown; a dark brown streak on discocellular, post-medial line fine, fuscous brown; termen narrowly brown; a whitish marginal line marked by a black line between veins 6 and 7.

Expanse, male 140 mm., female 158 mm.

Habitat.—Balzabamba, Ecuador.

Type.—Cat. No. 23976, U. S. Nat. Mus.

***Automeris antioquia*, new species.**

Male.—Head and thorax cinnamon brown, the latter paler shaded behind. Abdomen above bright roseate at base; dorsal roseate tufts on basal half; terminal half grayish tinged with roseate. Body below yellow. Legs brown; tarsi dark brown. Fore wings reddish brown mottled with yellow; a white basal line; antemedial line deep yellow slightly outbent across cell, slightly inbent below cell to vein 5, outwardly edged in cell and just below it by some black scaling, with a white point on median, one close below it and a point on vein 1; a large dark brown shade on and beyond discocellular; its inner edge almost straight and defined by a fine yellow line, its outer edge lunular with three black points; a black point on its inner edge on median; outer line straight from costa near apex to

middle of inner margin, dark reddish brown inwardly finely edged with white expanding into points on veins; a broad reddish brown vertical shade from costa to outer line post-medially; some fuscous subterminal spots. Hind wings brilliant rose color, ocellus very large, the center steel gray broadly edged with black and then with a fine yellow brown and white line; the center of ocellus with black and white scaling surmounted by a curved white line, above it an angled brownish yellow line, below it a single line; a fine black, deeply lunular line below ocellus outwardly edged by a broad reddish brown shade; termen pale roseate, crossed by yellow veins; a terminal dark brown line; cilia deep yellow. Fore wings below yellow, the costal and outer margins irrorated with reddish brown; a very large black discal spot containing a white point; outer line more remote from apex, fine, fuscous wavy, interrupted by veins; base of inner margin reddish. Hind wings below yellow irrorated with reddish brown; a white point finely edged with black at lower angle of cell; a fine post-medial lunular wavy line; subterminal dark spots on interspaces.

Expanse, 97 mm.

Habitat.—Departamento de Antioquia, Colombia.

Type.—Cat. No. 23977, U. S. Nat. Mus.

Automeris curitiba, new species.

Male.—Head, collar and thorax dull grayish brown, the patagia outwardly with a tuft of luteous hairs. Abdomen above purplish red, underneath and anal hairs ochreous. Fore wings: base broadly and costal margin shaded with light ochreous brown, the termen light olive brown; discocellular spot very faint and linear; a straight line from apex to inner margin near middle, inwardly roseate white preceded by similar shading, outwardly olive brown slightly darker than terminal space. Hind wings: cell and inner margin broadly covered with purplish red hairs reaching the inner side of ocellus, which is otherwise surrounded by yellow; the ocellus broadly circled with black, its center dark brown crossed by a white line, and showing some white beneath the brown scaling;

a post-medial fine black line not reaching costa finely edged outwardly with yellow, then a subterminal purplish red shade; termen roseate gray. Fore wings below tinged with roseate to post-medial line which is fine, darker roseate, starting from costa near apex; a brown spot around discocellular crossed by a white line. Hind wings below pale ochreous white; a small white spot on discocellular edged with brown; a faint, roseate, straight post-medial line.

Expanse, 55 mm.

Habitat.—Curitiba, Brazil.

Type.—Cat. No. 23978, U. S. Nat. Mus.

Ormiscodes caxambua, new species.

Male.—Palpi dull dark brown, with darker shading behind. Head dark reddish brown; a light brown tuft between antennæ; antennæ with the shaft brown, the pectinations fuscous. Collar and thorax dark brown. Abdomen above dark yellow with black segmental lines, underneath dark grayish brown. Thorax below and legs dark brown. Fore wings ochre white irrorated and suffused with dull grayish brown; the base broadly fuscous brown with short pale streaks at base of cell, also above and below vein 1, limited by a curved pale ante-medial shade outwardly edged by a dark line, deeply dentate on median vein and submedian fold, followed in cell by a fuscous streak; a black spot on discocellular; a pale post-medial shade outcurved and somewhat macular from costa to vein 5 preceded by dark shading and followed by a dark spot on costa; from vein 5 to inner margin the post-medial is dark, lunular, with inwardly projecting lines on veins, and is outwardly narrowly pale edged, followed from vein 3 to inner margin by a narrow dark shade, expanding to tornus; irregular dark shading on terminal space crossed by the paler veins; cilia dark with pale spots at veins. Hind wings pale thickly suffused with dark shading, darkest from cell to inner margin; a black spot on discocellular; an interrupted subterminal fuscous shade, a dark terminal line; cilia with a pale shade at base. Wings below suffused with fuscous gray; fore wings

with pale shading at base, on termen and post-medially; inner margin broadly clear pale yellow from base, but not reaching tornus; hind wings with a yellowish white post-medial shade, and some irregular similar marginal shading; the black discal spot as above.

Expanse, 53 mm.

Habitat.—Caxambu, Brazil.

Type.—Cat. No. 23979, U. S. Nat. Mus.

***Dirphia zikani*, new species.**

Male.—Head brown, thorax brownish gray the hairs posteriorly tipped with whitish roseate. Abdomen above black with fine white segmental lines, downbent sublaterally; anal hairs red; abdomen below dark gray brown; legs brown, tarsi roseate. Fore wings grayish brown, the lines fuscous brown; antemedial line vertical from costa to median, then slightly inbent to inner margin, shaded on either side with white, more broadly so proximally; a black point on discocellular and a fine outbent line from it to vein 4, post-medial black slightly inbent from costa to middle of inner margin edged on its proximal side with white; a subterminal lunular whitish line outwardly shaded with dark gray, very indistinct from vein 4 to apex. Hind wings grayish brown; base of costal margin roseate; a fine dark line on discocellular; a dark post-medial line from costa to vein 4; cilia white on interspaces. Fore wings below pale roseate brown; a black streak on discocellular; a fine black post-medial line; traces of subterminal small spots. Hind wings below whitish mottled with roseate brown to near middle; a brown post-medial thick line crossing an angled black line on discocellular, followed by a less distinct brown shade; a subterminal brown shade broad and lunular between veins 2 and 4, and outwardly edged by a faint whitish line.

Expanse, 50 mm.

Habitat.—Passa Cuatro Minas, Brazil.

Type.—Cat. No. 23980, U. S. Nat. Mus.

Named after its discoverer.

NEW FORMS OF AMERICAN MOTHS

(Lepidoptera)

By HARRISON G. DYAR

Family ARCTIIDÆ

***Pygarcia elegans haematodes*, new variety.**

Head with the front entirely crimson, including the vertex except for a small pale spot posteriorly. Else as in *elegans roseicapitis* Neumoegen & Dyar.

Type, male, No. 24019, U. S. Nat. Mus.; Orizaba, Mexico (Schaus collection); paratypes, four males and four females, Cuernavaca, Mexico, July and August, 1906 (W. Schaus); Paso San Juan, Vera Cruz, Mexico (Schaus collection); Jalapa, Mexico (Schaus collection); San Pedro Sula, Honduras (E. Wittkugel, Dyar collection); Avangarez, Costa Rica, July, 1908 (W. Schaus); Quirigua, Guatemala, March (Schaus & Barnes).

***Euchaetias antica sinaloënsis*, new subspecies.**

Male as in *antica antica* Walker except that the base on hind wing to inner margin is hyaline. Female somewhat smaller than in *antica antica*, the coloration the same. Expanse, male, 28 mm.; female, 34–42 mm.

Type, male, No. 24020, U. S. Nat. Mus.; Venadio, Sinaloa, Mexico (A. Kusche); paratypes, seven females with the same data.

***Euchaetias albicosta densa*, new subspecies.**

Male fore wing broader than in *albicosta albicosta* Walker, not uniformly blackish but powdered with mouse-gray scales, forming a wavy outer band as in the female. Hind wing more evenly rounded, blackish throughout, without subhyaline base. Female with outer wavy pale line on fore wings, not relieved by a darker shade within.

Types, two males, No. 24021, U. S. Nat. Mus.; Venadio, Sinaloa, Mexico (A. Kusche); paratypes, four females with the same data.

Family NOCTUIDÆ

Subfamily AGROTINÆ

***Heliolonche dysseteta*, new species.**

Fore wing dark brown, irrorate with tawny scales; median area lighter, relieving a rounded obscure reniform, with lighter center, and a narrow dark outer line, slightly excurved above. Hind wing black, with a short yellow band in the disk, cut off at both ends; fringe pale yellowish. Expanse, 19 mm.

Type, female, No. 24087, U. S. Nat. Mus.; Guerrero, Mexico, November, 1920 (R. Müller). Paratypes, male and female, with the same data.

***Thyreion gelotopoeon*, new species.**

Fore wing dark brown, the subterminal space darker and smooth; lines slender, brown, wavy, the inner of three arcs, produced below vein 1, the outer denticulate on the veins, and followed by minute white points in the brown shade; orbicular round, with central dot; reniform slenderly outlined, full, indented and dark-filled; median shade curved from reniform to inner margin; terminal space evenly brown; fringe darker. Hind wing sordid whitish, with a shaded discal mark; a broad blackish outer border, containing a spot of the ground color; fringe pale. Expanse, 33 mm.

Type, female, No. 24088, U. S. Nat. Mus.; Tucuman, Argentina, March 26, 1917 (E. W. Rust); paratypes, four females, two with the same data; Tucuman, Argentina, December, 1905 (E. Dinelli); La Rioja, Argentina (E. Giacomelli).

Commonly determined, both locally and at the U. S. National Museum, as *Chloridea obsoleta* Fabr.; but the spinulation of the fore tibiæ is different, although the frontal plate above the tongue is very weak, and not strong, as in typical *Thyreion*.

***Mesembreuxoa exsiccata*, new species.**

Fore wing dark gray, smooth and uniform; inner line blackish, double, faint; claviform a trace; reniform large, full, solidly blackish filled; outer line a row of points, black within, white without; black terminal dots between the veins. Hind

wing with the basal area whitish, veins gray, and broad terminal area also dark gray; fringe whitish with gray interline. Expanse, 35 mm.

Type, female, No. 24093, U. S. Nat. Mus.; Mexico City, Mexico, October, 1920 (R. Müller).

Subfamily HADENINÆ

Hydroeciodes catadea, new species.

Male antennæ shortly serrate and ciliate. Fore wing yellow, shaded and irrorate with red-brown; reniform and orbicular full, rounded, strongly dark-edged, pale yellow and contrasted, without spots; subbasal line oblique, rigid, oblique from cell to inner angle; inner line faint, forming an arc below vein 1; claviform indistinct, but followed by a dark brown cusp; median line from costa, angled in cell, bent at right angles below reniform and reversed to inner margin; outer line denticulate on the veins, narrow; subterminal space light, running to apex; terminal space dark, obliquely cut off at vein 8. Hind wing blackish except on costa; fringe pale reddish. Expanse, 28 mm.

Type, male, No. 24090, U. S. Nat. Mus.; Mexico City, Mexico, October, 1920 (R. Müller).

Hydroeciodes parafea, new species.

Much as in the preceding; smaller, the lines browner and less contrasted; stigmata smaller, the reniform with a white arcuate spot below and a small one in the upper outer corner, the center lined with red; subterminal space yellow, cut by reddish veins; terminal space dark brown, with an inward angle at vein 5.

Type, male, No. 24091, U. S. Nat. Mus.; Mexico City, Mexico, October, 1920 (R. Müller).

In both of these species there are but one or two hairs to be found on the eyes, though they are well lashed.

Hyssia biterminosa, new species.

Fore wing very dark brown at the base, beyond the cell and beyond the claviform paler brown nearly to the margin; or-

bicular and claviform round, both large, black-ringed, concolorous with the ground; reniform narrow, pale, joining the pale outer shade and a little lighter than it; lines obsolete, the outer showing a trace below; terminal area and fringe dark, cut by a light subterminal line, which shows an obsolete tooth at vein 3 close to the margin. Hind wing dark fuscous, lighter at base, relieving a small discal dot. Abdomen dark brown above, mingled with black, the anal tuft yellowish. Expanse, 32 mm.

Type, female, No. 24092, U. S. Nat. Mus.; Zacualpan, Mexico, September, 1919 (R. Müller).

Subfamily CUCULLIINÆ

Walterella, new genus.

Tegulæ not produced behind into a hood; frons with truncate conical prominence with raised edges, the upper edge produced into a long point, the lower edge tridentate. Tarsi unarmed; legs and thorax clothed with hairs and long-stemmed tridentate scales, tufted at the ends of patagia and metathorax; abdomen with a small tuft on the third segment; eyes slightly reduced in size, strongly lashed; antennæ of male simple, minutely ciliate.

Walterella eudesmia, new species.

Thorax dark gray, the tuftings at end of patagia and metathorax brown. Fore wing narrow, obliquely cut at anal angle; gray, the basal space light, except on inner margin, bounded by the dark inner line, which forms a right-angle on submedian, preceded by an inner fainter duplication; median space shaded with blackish, most strongly so costally; orbicular and reniform rounded, similar, each of a double black ring, the reniform squarely cut inwardly; claviform obscure, but long; outer line dark, denticulate, faintly doubled, drawn in below median and running parallel to inner margin almost to inner line; followed by an olive-brown band, which rises broadly from inner margin before tornus, running obliquely nearly to termen, narrowed, angled, and continued faintly to costa at apex, broken by gray

and whitish shades, the apical veins partly black lined. Hind wing whitish, irrorated with fuscous, the median vein partly dark marked; a terminal black line, broken toward apex. Expanse, 36 mm.

Type, male, No. 24095, U. S. Nat. Mus.; Tempe, Arizona, December 30, 1919, at light (Walter & Martinez).

Cerapoda oblita Grote.

Oncocnemis oblita Grote, Bull. Geog. Surv. Terr., iii, 117, 1877.

Calophasia strigata Smith, Trans. Am. Ent. Soc., xviii, 107, 1891.

? *Calophasia strigata* Hampson, Cat. Lep. Phal. B. M., vi, 125, 1906.

Calophasia strigata Barnes & McDunnough, Check List Lep. Bor. Am., No. 2012, 1917.

Cerapoda arrosta, new species.

Markings much as in *oblita*; white mark below reniform a short thick bar, slightly lunate; terminal shade preceded by a row of rounded spots between the veins, defined by white outwardly; terminal line and fringe cut by a series of distinct white dashes; orbicular longer and extending obliquely onto the costal region more than in *oblita*. Hind wing of male whitish with narrow terminal gray area; of female dark fuscous, darker than in *oblita*. Expanse, male, 32 mm; female, 33 mm.

Type, male, paratype, female, No. 24103, U. S. Nat. Mus.; Garfield County, Colorado, 6,000 feet (D. Bruce).

The male has been figured in Holland's "Moth Book," plate xx, fig. 17, as *Calophasia strigata* ♀.

Cerapoda defectipes, new species.

Fore wing gray, with a white shade through submedian fold, beyond cell and in zigzag subterminal line; veins lined with black, narrowly edged with white on both sides; inner line absent; claviform a long white streak from base to middle, edged with black below and brownish above; a thick white dash for orbicular; reniform absent; outer line blackish, single, evenly curved; subterminal shade followed by two series of blackish streaks, leaving the margin below veins 4 and 7; fringe whitish, with black patches between the veins. Hind wing

whitish, median vein dark lined; a faint outer continuous fuscous line. Expanse, 40 mm.

Type, female, No. 24104, U. S. Nat. Mus.; Miles City, Montana, July 1, 1890 (C. A. Wiley).

The single specimen has lost the legs, so the generic reference may possibly be in error.

Subfamily ACRONYCTINÆ

Xanthothrix stagmatogon, new species.

Eyes perceptibly narrowed, although not nearly so much as in the type of the genus. Frons with a very large circular process with raised edges and central prominence, the latter in the form of a vertical plate with a little knob at the lower extremity.

Head, thorax and fore wing above dark orange; through the cell and following vein 2 above and below, diffused brown-black streaks; a round white spot beyond the lower extremity of the cell; a slender blackish subterminal line, bent inward subcostally; a black terminal line, preceded by a series of diffused yellowish spots, the one at tornus the largest; fringe brownish black. Hind wing, abdomen and both wings below black, except the inner area of fore wing, which is pale. Expanse, 16 mm.

Type, female, paratypes male and female, No. 24085, U. S. Nat. Mus.; Guerrero, Mexico, November, 1920 (R. Müller).

In the male, the inner area of fore wing up to the white spot is lighter and yellowish, the veins retaining the dark orange ground.

Chlorothrix, new genus.

Fore wing with an areole; fore tibiæ and tarsi without spines or claws; frons with a shovel-shaped process at the middle, the plate below short, smooth, narrowly emarginate in front and angled at the sides; vestiture of thorax, hairs, with a few scales intermixed.

Chlorothrix zothecaea, new species.

Fore wing pale clay-color, thickly irrorate with olive green;

inner, median and outer lines of the ground, slightly curved, the median the most so, over the cell, shaded with green within; two small green dots at end of cell. Hind wing strongly shaded with fuscous, showing traces of a darker outer band. Expanse, 26 mm.

Type, female, No. 24089, U. S. Nat. Mus.; La Rioja, Argentina (E. Giacomelli).

Sent as *Chloridea virescens* Fab.

Family NOTODONTIDÆ

Melalopha paraphora, new species.

Large; pale gray; the lines much as in *apicalis* Walker, but wavy and dislocated, the oblique line between inner and outer lines being strongly bent; ground color pale gray, blotched with darker gray, especially at base, in the V below vein 2 and the outer and oblique lines; outer line with very little reddish beyond toward costa, fine in the male, more angled and broadened in the female. Thorax with anterior dark brown mark. Expanse, male, 31 mm.; female, 38 mm.

Type, male, No. 24022, U. S. Nat. Mus.; Williams, Arizona, June 6, 1901 (H. S. Barber); paratype, female, Manitou, Colorado, July (B. Neumoegen, Schaus collection).

Family PYRALIDÆ

Subfamily GALLERIINÆ

Aganactesis, new genus.

Hind wing with vein 3 present, 4 absent; fore wing with 7-10 stalked; all veins present; 7 from beyond 9; cell long; proboscis absent; palpi of male slender, incurved, the long end-joints crossed, of female longer, porrect and drooping; hind wing with veins 7 and 8 strongly anastomosing; male with a large tuft of scales in fold at base of costa of fore wing below.

Aganactesis indecora, new species.

Dark gray, the fore wing nearly uniform, without lines, a scattering of black scales, generally along the veins, and forming a row of terminal dots at the ends of the veins. Hind

wings lighter gray, the costal area dark. Fringe of both wings lighter.

Expanse, male, 21–22 mm.; female, 26–30 mm.

Described from two males and six females, type No. 23971, U. S. Nat. Mus.; Trinidad, British West Indies, collected at quarantine, Los Angeles, California, from Cassia bean pods, September 17, 1920 (J. W. Mashmeyer).

Subfamily CRAMBINÆ

Crambus costalipartella, new species.

Fore wing white, a dark gray band from base, occupying the costal third of wing, but leaving the costal edge white; scattered gray-brown scales on the inner third of wing, not forming a solid band; termen brown, with darker dots at the ends of the veins. Hind wing dark fuscous, the fringe whitish, cut by gray. Abdomen dark fuscous, the terminal tuft whitish. Expanse, 17 mm.

Types, three females, No. 24015, U. S. Nat. Mus.; Lake View, Montana, August 4, 1920 (A. N. Caudell).

Crambus tripsacas, new species.

Fore wing silvery white; three rounded dark brown spots erect from middle of inner margin, the upper at the end of the cell smallest; termen brown, incised by the veins, cutting through toward apex, where the brown border is narrow; fringe brown; costal edge brown below. Hind wing pure white. Head, thorax and abdomen white, the collar with a yellow-brown spot on each side. Expanse, 9 mm.

Veins 11 and 12 of fore wing anastomose.

Type, male, No. 24016, U. S. Nat. Mus.; Miami, Florida (W. Schaus).

Subfamily SCOPARIINÆ

Scoparia basalis pacificalis, new subspecies.

Fore wing light gray, the lines a little lighter, dark-edged; inner curved above, outer indented subcostally, then gently oblique; a black basal dash; a black patch at middle of inner line, prolonged below by the claviform; a square black patch

at end of cell between two cusps; a dark shade beyond outer line, becoming very narrow centrally; terminal dark spots, not widened centrally. Hind wing pale fuscous. Expanse, 18 mm.

Types, No. 24017, U. S. Nat. Mus., two males and two females; Victoria, British Columbia, Canada, July 16-17, 1920 (E. H. Blackmore); Mount Newton, August 1, 1920 (E. H. Blackmore); Grayland, Washington, August 15, 1918 (H. K. Plank).

A large Pacific coast form of *basalis* Walker, without the usual dark mark on the center of termen.

Scoparia commortalis, new species.

Fore wing pale gray, irrorate with brown; a narrow but long, disturbed basal dash; inner line pale, curved, followed by brown scales, claviform indicated by a dot; a small dash at base of vein 4; outer line pale, distinct, slightly excurved on central third, followed by a broad dark brown band, which reaches termen except for a narrow, wavy, subterminal gray space; termen very narrowly pale; fringe pale with checkered interline, faintly doubled. Hind wing pale fuscous, with outer pale line, the terminal area darker. Expanse, 18 mm.

Types, three males, No. 24018, U. S. Nat. Mus.; Victoria, British Columbia, Canada, July 15 and 17, 1920 (E. H. Blackmore).

Nearest to *rectilinea* Zeller, but the outer line less rigid and subterminal shade brown and contrasted.

Scoparia extincta, new species.

Fore wing without perceptible tufts of raised scales in the cell; uniformly brownish gray, shining; two small black dots at the end of the cell, and a third beyond, below the base of vein 3; outer line pale, diffuse, strongly excurved above middle, followed by a broad ill-defined darker shade, in which faint traces of a pale subterminal line appear; black terminal dots at the ends of the veins; fringe pale. Hind wing sordid whitish. Expanse, 21 mm.

Type, male, paratypes five males, No. 24086, U. S. Nat. Mus.; Mexico City, Mexico, August, 1920 (R. Müller).

Subfamily PHYCITINÆ

Pyla sylphiella, new species.

Fore wing brownish black, sparsely dusted with coppery atoms; lines very indistinct, blackish, the outer excurved medially. Hind wing black. Expanse, 20 mm.

Type, male, paratype, female, No. 24100, U. S. Nat. Mus.; Mount Rainier, Washington, August 3, 1906 (Dyar & Caudell).

Larger than *rainierella* Dyar, the irrorations bronzy, not silvery.

Pyla feella, new species.

Fore wing black, densely irrorated with coppery scales with purple reflection, taking a green tint only in very oblique light; lines broad, black, nearly straight. Hind wing black. Expanse, 22 mm.

Type, male, paratypes, male and two females, No. 24101, U. S. Nat. Mus.; Bullfrog Lake, Sierra Nevada Mountains, California, 10,634 feet, August 13, 1914 (F. Grinnell, jr.).

Similar to *viridisuffusella* Barnes & McDunnough from the Tuolumne Meadows, but coppery purplish instead of green.

Pyla blackmorella, new species.

Black, without metallic scales; fore wing with the lines powdery, grayish white; inner oblique, broadening diffusely toward costa, dentate on median vein; two dark dots at the end of the cell, defined by a broad oblique band of grayish scales; outer line narrow, broken opposite cell, the middle segment excurved and denticulate; some gray scales on termen, defining a black terminal line, narrowly cut on the veins. Hind wing brownish black. Expanse, 22 mm.

Type, male, paratype, male, No. 24102, U. S. Nat. Mus.; Mount Tzouhalem, Duncan, British Columbia, June 24, 1913 (E. H. Blackmore).

The paratype has been returned to Mr. Blackmore at Victoria, B. C.

THE AMERICAN AEDES OF THE PUNCTOR GROUP

(Diptera, Culicidæ)

PLATE I

BY HARRISON G. DYAR

It may be best to substitute the subgeneric name *Ochlerotatus* for the group treated by me as *Heteronycha* (this article follows the one in *Ins. Ins. Mens.*, viii, 106-120, 1920). The two names differ in time of appearance only by page priority, being actually simultaneous. The principal reason for the change is to agree with European authors. Other reasons are: *Ochlerotatus* was clearly defined by Lynch Arribálzaga with a well-known type species (*confirmatus* Arrib. = *scapularis* Rond.), while *Heteronycha* was ill-defined, the type species *dolosa* consisting of males of *Culex bonariensis* Brèthes and females of *Aedes lynchii* Brèthes. Again *Ochlerotatus* was already used by Coquillett (1906), who referred *Heteronycha* to the synonymy of *Culex* on the erroneous association of the sexes made by Arribálzaga. Finally by the first reviser principle, the type of *Heteronycha* was fixed to the *Culex* element by the action of Theobald in 1901.

The *punctor* group as defined by me (*Ins. Ins. Mens.*, viii, 105, 1920) divides into two series, the *punctor* series proper, in which the spine on the basal lobe of the side piece of the male hypopygium is a normal spine, and the *spencerii* series, in which this spine is modified. The first series is represented in the north European fauna almost species by species; the second series is not represented in Europe at all, as far as present researches show.

The male hypopygium of all but two of the *punctor* series is so similar that it would be advisable to treat them as local subspecies, were it not for the fact that two forms, differing in larvæ and habits, occur in the same faunal region, flying together. The subspecific conception cannot apply to such forms.

SERIES 1

SPECIES 1

Aëdes (Ochlerotatus) dysanor, new species.

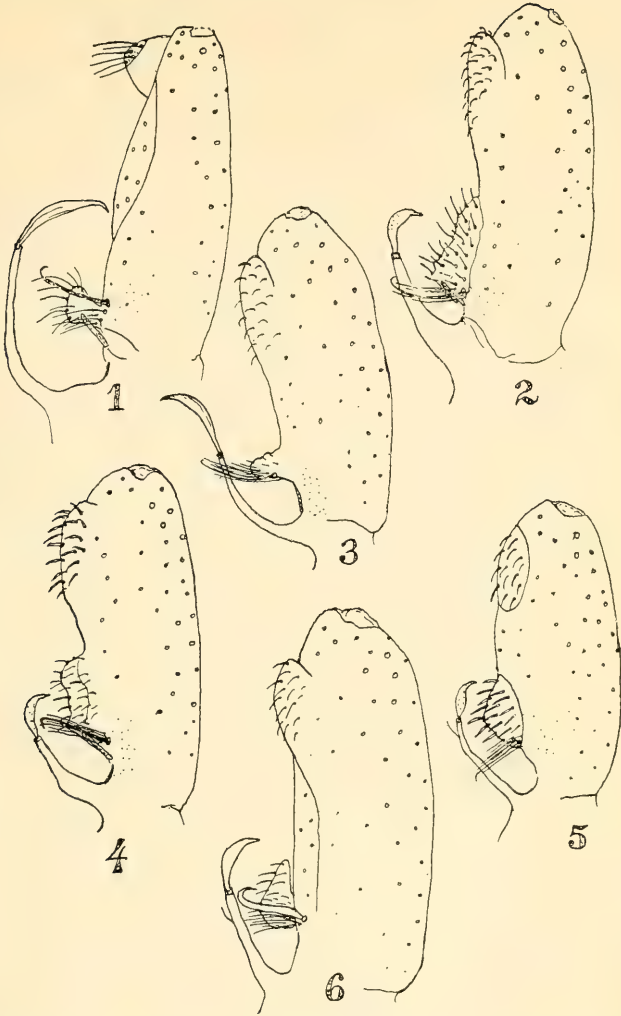
Mesonotum gray at the sides, the dorsal lines brown, generally separate with a tendency toward suffusion, sometimes confluent in a square band; abdominal bands white, narrowed centrally, moderately broad; generally as in *punctor*, apparently smaller. A narrow white line on the outer side of hind tibiæ.

Hypopygium. Apical lobe of side-piece as in *punctor*; basal lobe small, conically elevated, with an oblique basal chitinated rod as in *lazarensis* (Plate I, fig. 1), but the structure is much smaller, a group of long setæ on the basal aspect, of which one is curled at the end, but hardly stouter than the others, although with a larger basal tubercle. Claspette longer and slenderer than in *punctor*, the filament much longer, sickle-shaped, gradually widened in the middle (Plate I, fig. 3).

Type, male, No. 24023, U. S. Nat. Mus.; Plattsburgh, New York, April, 1905 (H. G. Dyar and Miss Edna Hudson); paratypes, males, six, Dublin, New Hampshire, May, 1909 (A. Busck); two, Saxeville, Wisconsin, May 23 and June 1, 1909 (B. K. Miller); one, Fort Ethan Allen, Vermont (through Dr. C. S. Ludlow); one, Fort Strong, Massachusetts, May 5, 1920 (R. I. Schott, through Dr. C. S. Ludlow).

No isolated larvæ are at hand; but the characters must be essentially as in *punctor*, for several specimens were determined by the late Frederick Knab as *auroides* Felt, the determination being made from the larvæ at the time, collected by Mr. August Busck.

This is evidently the American representative of the European *Aëdes concinnus* Stephens (= *sylvæ* Theobald, Lang, Handb. Brit. Mosq., 91, 1920, of which *dorsovittatus* Villeneuve is also a synonym according to F. W. Edwards, in litt.). I have before me no slide of *concinnus*; but the European form has the filament of the claspette very broad and short, as kindly



Hypopygium of *Aedes* of *puncator* group (setae clasper and basal organs omitted).

1. *Aedes lazarensis* Felt & Young, White Horse, Yukon Territory, July 2, 1919 (H. G. Dyar).
2. *Aedes puncator* Kirby, White River, Ontario, June 13, 1918 (H. G. Dyar).
3. *Aedes dysanor* Dyar, Plattsburgh, New York, April, 1905 (Dyar & Hudson).
4. *Aedes aboriginis* Dyar, Prince Rupert, British Columbia, May 31, 1919 (H. G. Dyar).
5. *Aedes fisheri* Dyar, Summit, California, June 18, 1920 (H. G. Dyar).
6. *Aedes aestivalis* Dyar, Sand Point, Idaho, July 3, 1917 (H. G. Dyar).

pointed out to me by Mr. F. W. Edwards (figured by Brolemann as *Culicada nemorosa salina* in Ann. Soc. Ent. France, 1919, 81, figs. 6-8). It is, therefore, clearly specifically distinct.

SPECIES 2

Aëdes (Ochlerotatus) punctor Kirby.

Culex punctor Kirby, Richardson's Fauna Bor.-Am., iv, 309, 1837.

Culex implacabilis Walker, List Dipt. Brit. Mus., i, 7, 1848.

Culex provocans Walker, List Dipt. Brit. Mus., i, 7, 1848.

Culex punctor Bethune, Can. Ent., xiii, 164, 1881.

Culex punctor Giles, Handb. Gnats or Mosq., 289, 1900.

Culex provocans Giles, Handb. Gnats or Mosq., 327, 1900.

Culex punctor Theobald, Mon. Culic., ii, 75, 86, 1901.

Culex nemorosus Theobald (in part, not Meigen), Mon. Culic., ii, 80, 1901.

Culex nemorosus Giles (in part, not Meigen), Gnats or Mosq., 2 ed., 436, 1902.

Culex punctor Giles, Handb. Gnats or Mosq., 2 ed., 435, 1902.

Culex abserratus Felt & Young, Science, n. s., xx, 312, 1904.

Culex punctor Dyar, Proc. Ent. Soc. Wash., vi, 39, 1904.

Culex nemorosus Felt (not Meigen), Bull. 79, N. Y. Sta. Mus., 332, 1904.

Culex abserratus Felt, Bull. 79, N. Y. Sta. Mus., 329, 1904.

Culicada abserratus Felt, Bull. 79, N. Y. Sta. Mus., 391c, 1904.

Culex punctor Coquillett, Proc. Ent. Soc. Wash., vi, 168, 1904.

Culex punctor Dyar, Journ. N. Y. Ent. Soc., xii, 169, 245, 1904.

Culex punctor Blanchard, Les Moust., 359, 1905.

Theobaldinella nemorosa Blanchard (in part, not Meigen), Les Moust., 391, 1905.

Grabhamia punctor Dyar, Journ. N. Y. Ent. Soc., xiii, 186, 1905.

Culicada auroides Felt, Bull. 97, N. Y. Sta. Mus., 448, 1905.

Culicada abserratus Felt, Bull. 97, N. Y. Sta. Mus., 467, 1905.

Ochlerotatus abserratus Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 19, 1906.

Ochlerotatus auroides Coquillett, U. S. Dep. Agr., Bur. Ent., Tech. Ser. 11, 21, 1906.

Ochlerotatus provocans Coquillett, U. S. Dep. Agr., Bur. Ent., Tech. Ser. 11, 21, 1906.

Ochlerotatus punctor Dyar, U. S. Dep. Agr., Bur. Ent., Circ. 72, 4, 1906.

Ochlerotatus auroides Dyar, U. S. Dep. Agr., Bur. Ent., Circ. 72, 5, 1906.

Culicelsa auroides Dyar, Journ. N. Y. Ent. Soc., xiv, 109, 1906.

- Aedes punctor* Dyar, Journ. N. Y. Ent. Soc., xiv, 194, 1906.
Aedes auroides Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 197, 1906.
Culicada abserrata Theobald, Mon. Culic., iv, 364, 1907.
Culicada nemorosa Theobald (in part, not Meigen), Mon. Culic., iv, 370, 1907.
Culicada punctor Theobald, Mon. Culic., iv, 371, 1907.
Culicelsa auroides Theobald, Mon. Culic., iv, 380, 1907.
Culicada abserrata Theobald, Mon. Culic., v, 306, 1910.
Culicada nemorosa Theobald (in part, not Meigen), Mon. Culic., v, 307, 1910.
Culicada punctor Theobald, Mon. Culic., v, 309, 1910.
Culicelsa auroides Theobald, Mon. Culic., v, 322, 1910.
Aedes abserratus Morse, Ann. Rept. N. J. Sta. Mus., 1909, 719, 1910.
Aedes abserratus Headlee, Bull. 276, N. J. Agr. Exp. Sta., 101, 1915.
Aedes abserratus Felt & Stage, Bull. 186, N. Y. Sta. Mus., 68, 1916.
Aedes centrotus Howard, Dyar & Knab, Mosq. No. & Cent. Am. and W. I., iv, 747, 1917.
Aedes provocans Howard, Dyar & Knab, Mosq. No. & Cent. Am. and W. I., iv., 748, 1917.
Aedes auroides Howard, Dyar & Knab, Mosq. No. & Cent. Am. and W. I., iv, 749, 1917.
Aedes abserratus Howard, Dyar & Knab, Mosq. No. & Cent. Am. and W. I., iv., 752, 1917.
Aedes punctor Howard, Dyar & Knab, Mosq. No. & Cent. Am. and W. I., iv, 754, 1917.
Aedes auroides Howard, Parasit., iv, 75, 1918.
Aedes punctor Dyar, Ins. Ins. Mens., vii, 13, 1919.
Aedes punctor Dyar, Ins. Ins. Mens., viii, 3, 1920.

The spine on the basal lobe of the side-piece of the male hypopygium is moderately stout only (Pl. I, fig. 2). In the European species, which has been called *nemorosus*¹ (Lang, Hand. Brit. Mosq., 91, 1920) this spine is distinctly stouter. Lang's figure 64 shows the structure well, except that the artist has omitted the long accompanying setæ. I have a specimen from the Royal Museum, Stockholm, Sweden, which agrees.

¹ Mr. Edwards informs me that the types of *nemorosus* Meigen are another species, leaving the present species nameless. Mr. Edwards thinks that *punctor* Kirby will cover both forms; but with this I can scarcely agree, and would suggest the name *meigenanus* for the European one.

Besides this structural difference, the habits of the European species as described by Lang are quite at variance with those of *punctor* in America. I am therefore of opinion that *punctor* and *nemorosus* Auct. are distinct species.

Typical genitalic mounts are before me from Mount Tom, Massachusetts, May 6, 1903 (F. Knab); Plattsburgh, New York, April, 1905 (H. G. Dyar); Dublin, New Hampshire, May, 1909 (A. Busck); Saxeville, Wisconsin, May 23, 1909 (B. K. Miller); White River, Ontario, April, 1918 (H. G. Dyar); Prince Albert and Beaver Creek, Saskatchewan, June, 1918 (A. E. Cameron); Agassiz, British Columbia, April 24, 1919 (E. Hearle); Prince George, British Columbia, May 14, 1919 (H. G. Dyar); Kwinitsa, British Columbia, May-June, 1919 (H. G. Dyar); White Horse, Yukon Territory, July 2, 1919 (H. G. Dyar).

SPECIES 3

Aedes (*Ochlerotatus*) *aboriginis* Dyar.

Aedes aboriginis Dyar, Ins. Ins. Mens., v, 99, 1917.

Aedes aboriginis Dyar, Ins. Ins. Mens., vi, 78, 1918.

Aedes aboriginis Dyar, Ins. Ins. Mens., viii, 25, 1920.

The spine on the basal lobe of the male hypopygium is still more slender than in *punctor*; the basal lobe itself is smaller and more distant from the apical lobe (Pl. I, fig. 4). The differences are, however, slight, and taken alone might be doubtful; but the larva differs in having the anal segment not ringed, the plate being divided on the ventral line. This is a large species, like *punctor*, inhabiting the moist northwest Pacific coast from Washington to Alaska. The larvæ frequent open, often dirty pools, frequently occurring in ditches and other artificial water.

SPECIES 4

Aedes (*Ochlerotatus*) *hexodontus* Dyar.

Aedes hexodontus Dyar, Ins. Ins. Mens., iv, 83, 1916.

Aedes hexodontus Dyar, Ins. Ins. Mens., v, 13, 1917.

Aedes hexodontus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 1041, 1917.

Aedes hexodontus Dyar, Ins. Ins. Mens., vi, 78, 1918.

Aedes hexodontus Dyar, Ins. Ins. Mens., viii, 23, 1920.

Aedes hexodontus Dyar, Ins. Ins. Mens., viii, 168, 1920.

The spine on the basal lobe of the male hypopygium is distinctly stout, the structure being practically inseparable from that of the European form. The present species, however, is confined to the mountains of California and Oregon, breeding in open shallow pools in spring. The winter is passed in the egg state. The coloration of the adults is variable, tending to brown or yellow suffused forms, rarely distinctly marked with two brown lines. This differs from the European *nemorosus* Auct., which is of the *punctor* type, the mesonotum yellow with broad central dark band.

SPECIES 5

***Aedes* (*Ochlerotatus*) *leuconotips* Dyar.**

Aedes leuconotips Dyar, Ins. Ins. Mens., viii, 24, 1920.

The spine of the basal lobe of the side-piece of the male hypopygium is very stout, and there is no marked differentiation from *hexodontus*. The coloration of the adult is as in *aboriginis*, but the species is not as large. The larvæ breed early in muskeg-pools in the moist coastal strip from British Columbia to Alaska. The larvæ agree structurally with both *hexodontus* and *punctor*; but the breeding pools are of a very different character, and the species appears to be distinct.

SPECIES 6

***Aedes* (*Ochlerotatus*) *cyclocerculus* Dyar.**

Aedes cyclocerculus Dyar, Ins. Ins. Mens., viii, 23, 1920.

In male genitalia and structure of larva indistinguishable from *leuconotips*. The larvæ inhabit muskeg-pools in the same region; but the species is smaller, the coloration of the adults different, and the larvæ darker and more gregarious. This is the commonest species in virgin forest on the coast of British Columbia and Alaska. The mesonotum is generally marked with dark side-stripes, the middle stripe more or less obsolete, which gives a unique appearance. Nevertheless, *cyclocerculus* and *leuconotips* may be varieties of one species. Further experience with these forms is desirable.

SPECIES 7

Aedes (Ochlerotatus) fisheri Dyar.

Aedes fisheri Dyar, Ins. Ins. Mens., v, 19, 1917.

Aedes fisheri Dyar, Ins. Ins. Mens., viii, 23, 1920.

Aedes fisheri Dyar, Ins. Ins. Mens., viii, 169, 1920.

The basal lobe of the side-piece of the male hypopygium (Pl. I, fig. 5) has the setæ coarse, the spine slender and confused in a group of similar setæ. The larva has the anal segment not ringed by the plate as in *aboriginis*, but the air-tube has detached teeth, a character unknown elsewhere in the *punctator* group. The species has so far been found only in the high Sierras of California, at the 7,000 foot level. The male is peculiar in having the mesonotum hairy as in the arctic species, although this character is not shared by the female. The palpi in the male, also, are distinctly shortened from the usual condition.

SERIES 2

In this series, the spine of the basal lobe of the side piece of the male hypopygium is very much thickened, but of a thin transparent consistency (Pl. I, fig. 6). The basal lobe itself is expanded, its outer margin free from the side-piece. There does not seem to be any specific modification of this structure in the following forms. Two of the species, *spencerii* and *idahoensis*, are separable by the peculiarly colored wing-scales, alternate veins being black and white scaled. These inhabit prairie country inland. The others have the scales not so contrasted in color. These are all flood species, breeding in pools filled by the high water of rivers or lakes.

SPECIES 8

Aedes (Ochlerotatus) spencerii Theobald.

Culex spencerii Theobald, Mon. Culic., ii, 99, 1901.

Culex spencerii Giles, Handb. Gnats or Mosq., 2 ed., 431, 1902.

Grabhamia spencerii Theobald, Mon. Culic., iii, 250, 1903.

Grabhamia spencerii Ludlow, Journ. N. Y. Ent. Soc., xi, 143, 1903.

Culex spenceri Dyar, Proc. Ent. Soc. Wash., vi, 41, 1904.

Grabhamia spencerii Theobald, Gen. Ins., Dipt., fasc. 26, 23, 1905.

Culex spenceri Blanchard, Les Moust., 277, 1905.

- Grabhamia spenceri* Blanchard, Les. Moust., 397, 1905.
Ochlerotatus spenceri Coquillett, U. S. Dep. Agr., Bur. Ent.,
 Tech. Ser. 11, 18, 1906.
Grabhamia spenceri Theobald, Mon. Culic., iv, 285, 1907.
Aedes spenceri Dyar, Proc. U. S. Nat. Mus., xxxii, 125, 1907.
Aedes spenceri Knab, Journ. N. Y. Ent. Soc., xv, 216, 1907.
Aedes spenceri Knab, Smith. Misc. Colls., quart. iss., 1, 541, 1908.
Grabhamia spencerii Theobald, Mon. Culic., v, 290, 1910.
Aedes spencerii Howard, Dyar & Knab, Mosq. No. & Cent. Am.
 & W. I., iv, 723, 1917.
Aedes spenceri Cameron, Agr. Gaz. Can., v, 557, 1918.
Aedes spenceri Cameron, Jn. Am. Med. Vet. Ass., liii, 633, 1918.
Aedes spencerii Dyar, Ins. Ins. Mens., vii, 37, 1919.

This species inhabits the open prairies in Canada, and is easily recognizable by the bicolored wing-scales and the pale dorsal stripe of the abdomen.

SPECIES 9

Aedes (*Ochlerotatus*) *idahoensis* Theobald.

- Grabhamia spencerii idahoensis* Theobald, Mon. Culic., iii, 250, 1903.
Ochlerotatus spenceri Coquillett (in part); U. S. Dep. Agr., Bur. Ent., Tech. Ser. 11, 21, 1906.
Aedes idahoensis Dyar & Knab, Proc. U. S. Nat. Mus., xxxv, 57, 1908.
Aedes spenceri Cooley (not Theobald), Bull. 109, Mont. Agr. Exp. Sta., 153, 1916.
Aedes spenceri Cooley (not Theobald), Bull. 112, Mont. Agr. Exp. Sta., 73, 1916.
Aedes idahoensis Dyar, Ins. Ins. Mens., v, 120, 187, 1917.
Aedes idahoensis Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 727, 1917.
Aedes idahoensis Dyar, Ins. Ins. Mens., vi, 78, 1918.
Aedes idahoensis Cockerell, Journ. Econ. Ent., xi, 199, 1918.

This species inhabits the limited prairies along river valleys in Colorado and Montana, Idaho, Nevada and eastern Washington, probably extending into southeastern British Columbia. The larvæ breed in early spring pools in arid land, and also to a less extent in later pools caused by irrigation or exceptional rains.

This is closely allied to *spencerii*, but inhabits a separate

region. The wing-scales are bicolored, but the abdominal pale stripe is only exceptionally present. There are larval differences between *idahoënsis* and *spencerii*.

SPECIES 10

Aëdes (Ochlerotatus) hirsuteron Theobald.

Culex hirsuteron Theobald, Mon. Culic., ii, 98, 1901.

Culex hirsuteros Giles, Handb. Gn. or Mosq., 2 ed., 451, 1902.

Culex reptans Smith (not Linnaeus), Bull. 171, N. J. Agr. Exp. Sta., 38, 1904.

Culex pretans Grossbeck, Ent. News, xv, 332, 1904.

Culex pretans Smith & Grossbeck, Psyche, xii, 17, 1905.

Culex pretans Smith, N. J. Agr. Exp. Sta., Rept. Mosq., 291, 1905.

Culex pretans Britton & Viereck, Rept. Conn. Agr. Exp. Sta. 1904, 271, 1905.

Culex hirsuteron Theobald, Gen. Ins., Dipt., fasc. 26, 27, 1905.

Culex hirsuteron Blanchard, Les Moust., 350, 1905.

Culex pretans Blanchard, Les Moust., 630, 1905.

Aëdes pretans Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 201, 1906.

Ochlerotatus pretans Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 18, 1906.

Ochlerotatus hirsuteron Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 21, 1906.

Ochlerotatus pretans Dyar, U. S. Dept. Agr., Bur. Ent., Circ. 72, 6, 1906.

Culicada pretans Theobald, Mon. Culic., iv, 353, 1907.

Culex (Ochlerotatus) pretans Viereck, 1st. Ann. Rept. Comm. Health Pa., 470, 1908.

Aëdes pretans Thibault, Proc. Ent. Soc. Wash., xii, 18, 1910.

Culicada pretans Theobald, Mon. Culic., v, 305, 1910.

Culex hirsuteron Theobald, Mon. Culic., v, 358, 1910.

Aëdes pretans Morse, Ann. Rept. N. J. Sta. Mus., 1909, 719, 1910.

Aëdes pretans Headlee, Bull. 276, N. J. Agr. Exp. Sta., 195, 1915.

Aëdes hirsuteron Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 743, 1917.

Aëdes hirsuteron Dyar, Ins. Ins. Mens., vii, 34, 1919.

The mesonotum is broadly dark brown in the middle, the usual two brown stripes being united into a band. This form inhabits the Atlantic region from southern Canada to Texas. The form is local and erratic as to appearance, breeding in low

pools filled by overflow from high water of rivers. There is usually a single spring generation in the north (adults, April, at Washington, D. C.; June, at Ottawa, Ontario, and Fort Snelling, Minnesota), but in the south the emergence seems to depend upon casual floods, which may not recur for a period of years. Specimens before me from Wister, Indian Territory, were taken in July, and Mr. E. W. Jackson of the Essex County Mosquito Extermination Board in New Jersey told me of an experience of his where a flood occurred in the valley of a river. He watched successive broods of *hirsuteron* appearing in higher and higher pools as the water was backed up farther from week to week, until finally pools were reached which had not been water-filled for twelve years preceding, yet *hirsuteron* larvæ appeared in them. Mr. Jackson asked me how long the eggs could live on the ground, a question more easy to ask than to answer.

SPECIES 11.

Aedes (Ochlerotatus) aestivalis Dyar (Pl. I, fig. 6).

Culex reptans Dyar (not Linnaeus), Proc. Ent. Soc. Wash., vi, 38, 1904.

Culex aestivalis Dyar, Journ. N. Y. Ent. Soc., xii, 245, 1904.

Grabhamia aestivalis Dyar, Proc. Ent. Soc. Wash., vii, 48, 1905.

Grabhamia aestivalis Dyar, Journ. N. Y. Ent. Soc., xiii, 54, 1905.

Aedes aestivalis Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 201, 1906.

Ochlerotatus aestivalis Coquillett, U. S. Dep. Agr., Bur. Ent., Tech. Ser. 11, 21, 1906.

Ochlerotatus aestivalis Dyar, U. S. Dep. Agr., Bur. Ent., Circ. 72, 6, 1906.

Aedes aestivalis Cameron, Agr. Gaz. Can., v, 557, 1918.

Aedes aestivalis Cameron, Journ. Am. Med. Vet. Ass., liii, 633, 1918.

Aedes aestivalis Dyar, Ins. Ins. Mens., viii, 18, 1920.

Slight larval differences have been observed between this form and *hirsuteron*, but the matter is insufficiently investigated. The form seems to be addicted to the vicinity of lakes rather than rivers, and probably breeds in pools filled by high water in spring. Some of the lakes in the mountains of the west rise

enormously. Kootenai Lake rose 24 feet in 1903, in spite of its great length (some 80 miles), producing flood conditions in low land. The three positive records for *aestivalis* (Kaslo and Sicamous in British Columbia, and Sand Point, Idaho) are all at large lakes. The specimens from Nanoose Bay, on Vancouver Island, recorded in the monograph, are evidently *aldrichi* which had flown across from the high water in the lower Fraser River. The worn specimens found by me at Prince George, British Columbia, are probably also *aldrichi*. It is impossible to be certain as between these two species with worn material.

SPECIES 12

***Aedes* (*Ochlerotatus*) *aldrichi* Dyar & Knab.**

Grabhamia spencerii idahoensis Aldrich (not Theobald), Theob., Mon. Culic., iii, 250, 1903.

Aedes aldrichi Dyar & Knab, Proc. U. S. Nat. Mus., xxxv, 57, 1908.

Aedes aldrichi Theobald, Mon. Culic., v, 620, 1910.

Aedes aldrichi Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 735, 1917.

Aedes aldrichi Dyar, Ins. Ins. Mens., v, 121, 1917.

Aedes aldrichi Dyar, Ins. Ins. Mens., vi, 78, 1918.

Aedes aldrichi Cockerell, Journ. Econ. Ent., xi, 198, 1918.

Aedes vinnipegensis Dyar, Ins. Ins. Mens., vii, 34, 1919.

Aedes aldrichi Hearle, Can. Ent., lii, 115, 1920.

Aedes aldrichi Dyar, Ins. Ins. Mens., viii, 198, 1920.

This is closely allied to *hirsuteron*, seeming distinct by the smaller size and usually divided mesonotal brown stripe. This is the species breeding in pools filled by high water from rivers in the region from the plains to the Pacific coast. It occurs all along the Yellowstone Valley in Montana, the lower Fraser River in British Columbia, and the lower Columbia River between Oregon and Washington. The adults fly considerable distances from the flood-waters, although not so far as the larger *vexans* Meigen which accompanies them. As shown by Mr. Eric Hearle, the larvæ occur in shaded alder bottoms, and not in the open pools infested by *vexans*.

A. vinnipegensis was described from the valleys of the Red and Assiniboine Rivers in Manitoba, Canada. The mesonotal

stripe is apparently undivided, yet there is a trace of the division in the better preserved specimens, and I now think that it is *aldrichi*, and not a form of *hirsuteron* as I was at first inclined to consider it.

SPECIES 13.

***Aedes* (*Ochlerotatus*) *gonimus* Dyar & Knab.**

Aedes gonimus Dyar & Knab. Ins. Ins. Mens., v, 165, 1918.

Aedes gonimus Dyar, Ins. Ins. Mens., viii, 199, 1920.

This form is at present known only by females from central Texas. Its exact position, therefore, is doubtful.

**TWO UNDESCRIBED SPECIES OF JAPANESE
PTYCHOPTERIDAE**

(*Diptera*)

BY CHARLES P. ALEXANDER

Two species of the genus *Ptychoptera* Meigen have hitherto been recorded from Japan. It is with pleasure that two additional forms are herewith made known, both from the island of Hokkaido. The material was included in a collection of Japanese Tipuloidea sent to me for naming by Dr. Shiraki, to whom I express my thanks for this and other valuable specimens from the Japanese Empire. The types are preserved in the writer's collection, additional material in the possession of Dr. Shiraki.

***Ptychoptera daimio*, new species.**

General coloration yellow, mesonotal praescutum with three broad, shiny black stripes; basal antennal segment yellow; tarsi dark brown; wings with a strong yellowish tinge, brown wing-markings very restricted; lateral lobes of the ninth tergite of the male hypopygium bifid.

Male.—Length, 10.5 mm.; wing, 12.3 mm.

Rostrum and front obscure yellow; palpi yellow, the terminal segment dark brown. Antennæ with the first scapal segment light yellow; second scapal segment brown; flagellum black. Head black.

Pronotum obscure yellow. Mesonotal praescutum yellow, with three broad, shiny black stripes that are nearly confluent, the lateral stripes continued caudad onto the scutal lobes; scutellum yellow; postnotum black, sparsely gray pubescent. Pleura dark, with a fine gray pubescence; dorso-pleural membranes obscure yellow. Halteres yellowish brown. Legs with the coxæ and trochanters yellow, whitish pubescent; femora brownish yellow, the tips broadly dark brown; anterior face of femora slightly darker than posterior face; tibiæ brownish yellow, the tips dark brown; tarsi dark brown. Wings with a strong yellowish tinge, the costal cell more saturated; wing-markings very restricted, appearing as narrow brown seams along the cord, at the tip of R_1 and at the forks of R_4+5 and M ; macrotrichia on wing-surface lacking in the bases of the principal cells. Venation: R_s comparatively short, straight; $r-m$ connected with R_s shortly before its fork.

Abdominal tergites obscure orange-yellow, with a broad median black stripe that is narrowly interrupted at the posterior margins of the segments; hypopygium blackish; sternites orange-yellow, sternites 6 and 7 black with the posterior margins broadly yellow. Male hypopygium with the region of the ninth tergite profoundly notched, with a small, oval hairy lobe at the base of the notch, the ends of the tergal lobes pale, deeply bifid. Caudal margin of the eighth sternite produced into a short, broad truncated median lobe, immediately dorsad of which lie two small lobes that are densely covered with long, erect, silvery setæ.

Habitat.—Japan.

Holotype, male, Teshio, Northern Hokkaido, July 14, 1916 (T. Isshiki). Shiraki No. 6988.

The general appearance and size of the present species is somewhat as in *P. albiniana* (Fabr.) of Europe.

***Ptychoptera subscutellaris*, new species.**

Related to *P. scutellaris* Meigen (Europe), differing in the structure of the male hypopygium.

Male.—Length about 9 mm.; wing, 9.2 mm.

Rostrum dark; palpi obscure yellow, darker toward the tip. Antennæ with the first segment dark brown; second segment dark brown with the apical half obscure yellow; flagellum black. Head black.

Mesonotum shiny blue-black, only the median lobe of the scutellum obscure yellow. Pleura dark, gray pruinose; dorso-pleural membrane pale yellowish brown. Halteres yellow, the knobs yellowish brown. Legs with the coxæ and trochanters obscure yellow; femora and tibiæ yellow, the tips narrowly dark brown; tarsi broken. Wings with a grayish yellow tinge, the costal and subcostal cells clearer yellow; very small and indistinct brown clouds at *r*; along the cord and outer end of cell 1st M_2 ; veins brown. Venation: *Rs* spurred at the angle.

Abdomen blue-black, the caudal margins of the tergites very narrowly pale. Male hypopygium differing from that of *P. scutellaris* in the following points: Ninth pleurite with the appendage elongate, near midlength with a conspicuous triangular blade borne on a moderately long pedicel; apex of the appendage beyond this lateral lobe dilated into a long, clavate lobe that is provided with abundant, long, dense hairs; base of the appendage triangular, heavily blackened, bearing several stiff setæ, the inner face projecting into a spine with a group of about nine subequal, powerful, black spinules at its base. In *P. scutellaris*, the appendage is slender with a small, nearly sessile, feebly triangular lobe close to the tip; base of the appendage not conspicuously blackened, with a powerful spine bearing about two or three smaller spinules along the margin; two or three similar spinules are scattered over the base of the appendage.

Habitat.—Japan.

Holotype, male, Sapporo, Hokkaido, August 28, 1909 (T. Shiraki). Shiraki No. 6978.

This species was described by Matsumura (Thous. Ins. Japan, Add. 2, pp. 473, 474, 1916) as *Ptychoptera scutellaris*, supposed new species. The name is already in use for one of the common European species of the genus. The writer

(Journ. N. Y. Ent. Soc., vol. 26, p. 67, 1918) has pointed out this fact and expressed the possibility of the Japanese insect being the same as the European form. A study of authentic specimens of both species soon revealed the differences above described and the species is consequently renamed as above.

THE MUSCOID GENERA PSEUDEUANTHA AND URAMYIA

(Diptera)

By J. M. ALDRICH

These closely related genera include both neotropical and nearctic species, all of which readily run to *Macquartia* in the table of genera in Coquillett's Revision of 1897. This use of *Macquartia* appears to have been the traditional sense, since one of the National Museum specimens placed by Coquillett in *M. pristis* had already been labeled "*Macquartia* sp." by Brauer and Bergenstamm. But Brauer himself had restricted the genus to a different group by designating *Tachina dispar* Fall. as type in 1893 (Verh. Z. B. Ges. Wien, 486); this species has the frontals extending below the base of the antennæ and the parafacials are heavily pilose. In this restricted sense *Macquartia* is not North American.

The two genera herein considered have the following characters in common: frontal bristles extending only to the base of the antennæ; eyes densely hairy; face receding; vibrissæ at edge of mouth, not approximated; parafacials bare, narrow; facial ridges with only a few small hairs below; palpi and proboscis normal; antennæ reaching nearly to vibrissæ, third joint about three times the second (two in *halisidotæ*), arista slightly or distinctly pubescent. Venation without unusual features, first posterior cell ending somewhat before the wing tip, open, third vein with a few hairs at base.

The chaetotaxy is strikingly uniform: ocellars directed forward but often small, verticals in the male hardly distinguishable from the postorbital row of hairs, but in the female well developed; male without reclinate frontals, the female with

the stout upper pair reclinate, the second slightly so; posterior dorsocentrals 3 large; anterior acrostichals 1 or 2 large, none immediately before the suture; scutellum with a long apical pair, one still longer at side, and one at base higher up, as well as a smallish, variable discal pair; sternopleurals 2 or 3; first abdominal segment usually with a large median marginal pair, second to fourth abdominal segments always with discals as well as marginals.

In the male sex the two genera are readily separated, since in *Pseudeuantha* the abdomen is normal, while in *Uramyia* the fourth segment is acutely produced dorsally beyond the genitalia into a more or less tail-like process, and the genitalia are somewhat concealed in the anterior part of an ovate cavity under the tergite. The peculiar "tail" is best developed in *producta*; as it is variable and decreases through the three species I have seen, and has no counterpart in the female, it should not be given too much taxonomic value.

But little has been published about the females of the tropical species, and they are not certainly identified in the National Museum collection. Those of *Uramyia* do not have any corresponding process, and at present the genera are difficult to separate in this sex.

Genus *Uramyia* Robineau-Desvoidy

Robineau-Desvoidy, Myodaires, 1830, 204. Sole species, *U. producta*, new.

Macquart, Dipt. Exot., Suppl. i, 1846, 296 (sep. 168) (*Aporia*, sole species, *A. quadrimaculata*, new).

Schiner, Novara Reise, 1868, 319 (*Aporia*).

Bigot, Bull. Soc. ent. France, 1885, xxxiii (*Oxydextia*, sole species, *O. acuminata*, new).

Van der Wulp, Tijdsch. v. Ent., xxx, 168, 1887; Biologia, Dipt., ii, 1891, 251.

Brauer u. Bergenstamm, Zweifl. Kais. Mus., iv, 1889, 130; vi, 1893, 135 (*Uramyia* and *Aporia*).

Townsend, Muscoid Flies, 1908, 67 (*Neaporia*, new name for *Aporia*, preoccupied). Proc. Ent. Soc. Wash., xiv, 1912, 48 (*Paraporia*, new name for *Neaporia*, preoccupied); Proc. U. S. N. M., vol. 49, p. 626, 1916 (*Uromacquartia*, type *halisidotae*, new).

TABLE OF SPECIES

- Abdomen narrow, the second segment only about as wide as long (neotropical).....*producta* Robineau-Desvoidy
- Abdomen of usual width, second segment evidently wider than long.
- Third antennal joint three times the second, arista with evident pubescence on basal two-fifths (neotropical),
quadrinaculata Macquart
- Third antennal joint twice the second, with very short pubescence (nearctic).....*halisidotæ* Townsend

Uramyia producta Robineau-Desvoidy.

Robineau-Desvoidy, Myodaires, 1830, 216, male (as female).—Brazil.

Schiner, Novara Reise, 1868, 320, male (*Aporia caudata*).—South America.

Bigot, Bull. Soc. ent. France, 1885, xxxiii (*Oxydaria acuminata*).—Mexico.

Brauer u. Bergenstamm, Zweifl. Kais. Mus. iv, 1889, 130; v, 1891, 133, syn.; vi, 1893, 135.—Central and South America.

Van der Wulp, Biologia, Dipt., ii, 1891, 251, pl. vi, f. 6; Tijdsch. v. Ent., xxx, 168, 1887, figs. (the second as *acuminata*). Cordoba and Jalapa. Mex.

Townsend Bull. Amer. Mus. N. H., xxxv, 15.—Brazil?

Represented in the National Museum by two males; one from San Bernardino, Paraguay (Fiebrig, collector), the other from the Williston collection, through the American Museum of Natural History, presumably collected in Brazil by H. H. Smith.

Van der Wulp, in 1887, believed that *acuminata* is distinct from *producta*; the difference, however, was in the length of the fourth abdominal segment of the male, which is pretty certainly a highly variable matter here, as it undoubtedly is in *halisidotæ*.

Uramyia quadrinaculata Macquart.

Macquart, Hist. Nat. Dipt., Suppl. i, 1846, 297 (sep. 169), pl. xv, f. 7, male (*Aporia*).—Colombia.

Schiner, Novara Reise, 1868, 319, male and female (id.).—Colombia.

Brauer u. Bergenstamm, Zweifl. Kais. Mus., iv, 1889, 130, fig. 222, male and female.—South America.

Van der Wulp, Biologia, Dipt., ii, 1890, 130, male (*Macquartia acuminata*, new).—Guerrero, Mexico, 7000-8000 ft.

Represented in the National Museum by two males; one labeled "Piches & Pirene Vs. Peru, 2000-3000 ft. Soc. Geog. de Lima;" the other Chapada, Brazil, from the Williston collection, through the American Museum (H. H. Smith, collector).

Two females from South America may represent one or both of the preceding species, but I am unable to decide what male if any in the collection they belong to. One is from Sao Paulo, Brazil (Dr. Lutz), the other from Rio Charape, Peru (Townsend). They have the arista almost without pubescence, and in both the wings are considerably infuscated.

Uramyia halisidotæ Townsend.

Townsend, Proc. U. S. N. M., 49, 1916, p. 626, male (*Uromac-quartia*). Aurora Mills, Ore.

Coquillett, Revision Tachinidæ, 1897, 64, included the type under *Macquartia pristis* Wlk.

Represented in the National Museum by the type male from Aurora Mills, Oregon, which was reared from *Halisidota argentata*; two females bred in the same lot but not mentioned as types by Townsend; one female, Siskyou County, California; one male, Stanford University, California, bred from *Halisidota argentata* by R. Patterson, March 8, 1898; one male, Monterey, California, reared from *Malacosoma* sp. by Geo. A. Coleman, June 1, 1904. I have also compared two males and three females from Corvallis, Oregon, one pair in my collection, the other sent by Dr. J. Bequaert; all these last I believe came from Professor Lovett originally.

The length of the tail-like prolongation of the abdomen is highly variable. It is shortest in the type specimen. The females differ very little from those of *Pseudeuanthia pristis*; the only character I could find was the presence of three sternopleurals, *pristis* appearing constant with two. In separating them on this character I had to transfer to *pristis* one female that Townsend had placed in *halisidotæ*. It would seem from this resemblance that *Pseudeuanthia* can hardly be

maintained as a separate genus from *Uramyia*, but until the females of the tropical forms are better known I would not go farther in combining the genera.

Unidentified species of *Uramyia*.

nitens Schiner, Novara Reise, 1868, 320 (Aporia)—South America.

Brauer u. Bergenstamm, Zweifl. Kais. Mus., v, 1891, 435, gen. ref.

Genus *Pseudeuantha* Townsend

Townsend, Proc. U. S. N. M., vol. 49, 1915, 416 (type and sole species, *P. linellii*, new = *Tricholyga caloptera* Bigot); vol. 56, 1919, 560 (*Anaporia*, type and sole species, *Aporia limacodis* Tns., = *Dexia pristis* Walker).

Coquillett, Revis. Tachin., 1897, 64 (*Macquartia* R. D.)

Adams, in Williston's Manual, 1918, 367 (id.).

Van der Wulp, Biologia, Dipt., ii, 1890, 128 (id.).

TABLE OF SPECIES

- a. Wings bicolored, yellow at base, blackish distally.
 - b. Anterior acrostichals only one pair; yellow of wing ending transversely at tip of auxiliary vein (Peru),
octomaculata Townsend.
 - bb. Anterior acrostichals two pairs; yellow of wing ending diagonally, reaching on the costa beyond the tip of the first vein (Mexico).....*caloptera* Bigot.
- aa. Wing hyaline or with only brown coloration.
 - b. Abdomen including first segment reddish, with median dorsal black stripe; anterior crossvein not infuscated (Florida).....*rubripes*, n. sp.
 - bb. Abdomen with first segment black, the crossvein infuscated (Mexico)*versicolor* Van der Wulp
 - bbb. Abdomen black.
 - c. Wing-veins bordered with brown.
 - d. Venter with long yellow bristles on basal half; three sternopleurals (Mexico).....*setiventris* Van der Wulp.
 - dd. Venter not with yellow bristles; wing infuscated along costa (Mexico).....*venusta* Van der Wulp.
- cc. Wings hyaline.
 - d. With only two sternopleurals.
 - e. Front very narrow in male, eyes almost contiguous, the frontal stripe reduced to a line or entirely obliterated; abdominal tergites 2 and 3 with long erect

- hairs and secondary smaller discals besides the large pair (New England to North Carolina)...*coquilletti*, n. sp.
 ee. Front wider, the frontal stripe always distinct, about as wide as one parafrontal; tergites 2 and 3 with a single pair of stout discals (widespread),
pristis Walker.
 dd. With three sternopleurals.....*johnsoni* Townsend.

In the table *versicolor* and *venusta* have been placed from the descriptions.

Pseudeuantha caloptera Bigot.

- Bigot, Annales Soc. ent. France, 1888, 263, male (as female) (*Tricholyga*).—Mexico.
 Giglio-Tos, Boll. R. Univ. Torino, viii, No. 147, 1893, male; Ditt. dell Messico, iii, 66, 1894, f. 16 (both *Aporia elegans*).—Tuxpango, Mexico.
 Brauer, Sitzungsber. Kais. Akad., cvi, 24, 1897, notes on Bigot's type, referring it to *Aporia*.
 Townsend, Proc. U. S. N. M., 49, 1915, 416 (*linellii*).—Tehuantepec, Mexico.

Represented in the National Museum only by Townsend's type female of *linellii*.

Pseudeuantha pristis Walker.

- Walker, List of Diptera in the British Museum, iv, 1849, 841 (*Dexia*).—Mass. Dipt. Saundersiana, 281, 1852 (*Dexia basalis*).—No locality. Synonymy of the latter by Major E. E. Austen from types, letter, November, 1920.
 Townsend, Psyche, vi, 275, 1892, female (as male) (*Aporia limacodis*).—New York; bred from *Limacodes* sp.
 Coquillett, Revis. Tachin., 1897, 64 (*Macquartia*).—New Hampshire, Massachusetts, District of Columbia, California (for his Oregon material, see *Uramyia halisidotae*).

I have seen the type of *limacodis* in the University of Kansas. I sent to the British Museum a specimen exactly matching one in the National Museum determined as *limacodis* by Townsend; Major Austen kindly compared it with the type of *pristis* and pronounced it the same. At the same time he reported the synonymy of *basalis* (letter, November, 1920).

Male. A robust form with comparatively large genital segments, which give the abdomen a truncated appearance. Black,

the palpi, labella and base of antennæ to arista yellow, knees and tibiæ yellowish, the anterior tibiæ less so. Front at narrowest averaging 0.12 of entire headwidth (five specimens gave 0.11, 0.12, 0.12, 0.12, 0.13); third antennal joint a little bulbous at tip; parafacials about as wide as third antennal joint; bucca about 0.3 the eyeheight; arista very slightly pubescent. Thorax cinereous with changing reflections dorsally; sternopleurals two strong, no trace of a third; pleuræ with only pale pile, the bristles, however, black. Abdomen shining black in most lights on half or more of each segment, the base and in certain lights nearly all the tergite, however, silvery pollinose. First segment with a marginal pair, second with marginal and discal pairs, third with discal pair and marginal row of 8; fourth with discal and marginal rows. First genital segment retracted, hardly visible; second large, black, apically more reddish, nearly bare. Inner forceps minute, united, the base heart-shaped, with long hairs directed backward, and with a slender, drawn-out tip; outer forceps about twice as long, brown, wide at base, tapering to a slender beak-like point that is curved slightly forward, densely hairy on outer side to beyond middle; penis shining brown, very thin in profile, just before its apex giving off in front at right angles a long flat process which curves gently upward and is divided at tip. Claspers not visible in the prepared specimen. Fifth sternite deeply incised, forming two convex lobes, rather prominent, black. Legs black, tibiæ yellowish; front tibiæ with an anterior row of about six even and rather long spines, and with two on outer hind side; middle tibiæ on outer front side with three, the middle largest and lower smallest, also one large inner and three on outer hind side; hind tibiæ with a very uneven row on outer hind side, three on inner hind (the intermediate minute), and two on outer front. Claws and pulvilli all very long. Wings hyaline, third vein with about three hairs at base; fourth vein bent almost at a right angle, occasionally a little angulated.

Female. Smaller; front uniformly narrowed to extreme vertex, where it is about one-sixth headwidth; only five pairs

of frontals. Abdomen in favorable specimens showing a short, shining black, bluntly pointed ovipositor; claws and pulvilli shorter.

Length of male 10.5 mm. (average of five); of female, 7.3 mm. (average of five).

Represented in the National Museum by the following specimens: one male, Falls Church, Virginia, matching the specimen sent to the British Museum; one male Beltsville, Maryland, labeled *Anaporia limacodis* by Townsend and agreeing exactly with the preceding; one male, Glen Carlyn, Virginia (Knab); two males, Lyme, Connecticut (Greene); two females, White Mountains, New Hampshire (Morrison); one same (Mrs. Slosson); one female, New Haven, Connecticut (Champlain); one female, Melrose Highlands, Massachusetts; one female, "*ex Empretia stimulea*," from H. G. Dyar, presumably bred at Yaphank, New York; one female, Virginia, reared from *Euclea cippus* (Koebele, Bureau Ent. No. 357-o, labeled *Exorista blanda* O. S., by Coquillett, and so cited by him in Revis. Tachin., p. 13); two females, East Verde River, Arizona, 4,500 feet (Townsend).

***Pseudeuantha coquilletti*, new species.**

Male. Smaller than the preceding and less robust, with smaller genitalia, which, however, are on exactly the same plan. The color of the pile of the pleura is evidently variable, as in the type it is wholly dark and in another it is dark above, in the others wholly pale as in *pristis*. Width of front in four males, 0.03, 0.04, 0.055, 0.06; average 0.046 of headwidth.

Female. The only differential character that could separate this from *pristis* as far as I now see would be the presence of secondary discal bristles, and this may be variable. One rather robust female taken at Lyme, Connecticut (Greene), has distinct secondary discals; but a pair taken the same day and another male the day after are typical *pristis*. The difficulty is increased by the fact that females of *pristis* are much smaller than their males, so that they agree in size with those of this species, although this has a smaller male than that of *pristis*.

Length of male 8.5 mm. (average of four); of female, 8.7 mm.

Type.—Male, No. 23940, U. S. Nat. Mus., labeled "Mass." and "out in small side black box, May 5, 1895." It had been placed by Townsend in his series of *limacodis*. Paratype males: one "on *Tortricidia flexuosa*, N. Y." (H. G. Dyar); one White Mountains, New Hampshire (Morrison), labeled "*Macquartia* sp." by Brauer and Bergenstamm; one, Canton, North Carolina (Sherman). One female supposed to belong here is from Lyme, Connecticut.

***Pseudeuantha rubripes*, new species.**

Male. Head and thorax black, abdomen and legs except tarsi reddish-yellow, abdomen, however, with a wedge-shaped black dorsal stripe which runs to a point on the fourth segment.

Head shaped as in *pristis*; antennæ reddish nearly to the middle of the third joint, arista very slightly pubescent near base; palpi yellow. Front in the single specimen 0.14 as wide as head; frontal stripe at narrowest slightly wider than para-frontal. Thorax with changeable cinerous pollen above, the sides more uniform; pleuræ with only pale hairs, the bristles black; stenopleurals two, stout. Tarsi black, claws and pulvilli decidedly shorter than in *pristis*. Genital segments not quite so large as in *pristis*, but the fifth sternite with large lobes as in that species. Second and third abdominal tergites with a single pair of stout discals, the first and second underneath with long pale hairs near the median line, as in other species. Wings hyaline, the fourth vein with a short appendage at the bend in the described specimen.

Length 9.6 mm.

Type.—Male, No. 23941, U. S. Nat. Mus.; from Miami, Florida, October 29 (Mrs. C. H. T. Townsend, collector).

***Pseudeuantha johnsoni* Townsend.**

Townsend, Canad. Ent., xxiv, 1892, 81, female (as male) (*Macquartia*).—Pennsylvania.

Coquillett, Revis. Tachin., 1897, p. 64 (*Macquartia*; misidentified, the specimen later described by Townsend as *Xanthocera*

clistoides); p. 96, female (*Exorista isae*).—District of Columbia; bred from *Isa inornata*.

Williston, Manual, 1908, 367, note on Townsend's type (*Macquartia*).

Townsend, Proc. Biol. Soc. Wash., xxviii, 1915, 22, notes misidentification by Coquillett.

I examined the type in the University of Kansas. It is a female, not a male as stated by Townsend, and seems to differ from *pristis* mainly in having three sternopleurals and a more yellowish cast to the pollen over most of the body. Coquillett misidentified it and described it again as *Exorista isae*, as I find from the type; his specimen is teneral and hardly shows any yellowish tinge, the shrinking of its head has brought one pair of frontals a little below the apparent level of the antennal insertion, which probably induced Coquillett to refer it to *Exorista*.

Represented in the National Museum only by the type of *isae*.

***Pseudeuantha setiventris* Van der Wulp.**

Van der Wulp, Biologia, Dipt., -ii, 1890, 129, pl. iii, f. 21, male (*Macquartia*).—Orizaba and Guerrero, Mexico, 8,000 feet.

Giglio Tos, Ditt. del Mess., iii, 50, notes (id.),—Solco, Mexico.

Represented in the National Museum by one male from Mexico City (Juan Müller), and one female, San Rafael, Vera Cruz, Mexico (Townsend).

***Pseudeuantha octomaculata* Townsend.**

Townsend, Proc. U. S. Nat. Mus., 56, 1919, 560, male—Huadquina, Peru.

Represented in the National Museum only by the type specimen.

Unidentified species of *Pseudeuantha*.

atrifrons Bigot, Annales, Soc. ent. France, 1888, 259, male (*Macquartia*)—Mexico.

venusta Van der Wulp, Biologia, Dipt., ii, 1890, 130, male (*Macquartia*).—Guerrero, Mexico, 6,000-7,000 feet.

versicolor Van der Wulp, ibidem, male (*Macquartia*).—Guerrero, Mexico, 7,000-8,000 feet.

THE ANTHOMYIID GENUS *ATHERIGONA*
IN AMERICA

(Diptera)

BY J. M. ALDRICH

The genus *Atherigona* was established by Rondani in 1856 (Prodrome, i, 97). He included but one species, which he designated as type—*Coenosia varia* Mg. Schiner in 1862 (Fauna Austr., i, 669) redescribed both genus and species. Rondani again in 1877 (Prodrome, vi, 15, 250) describes the genus and species, but makes the latter a synonym of *quadripunctata* Rossi; he adds a new Italian species, *soccata*. Meade (Descriptive List Br. Anth., ii, 76, 1897) also redescribes the genus and type species.

Stein has dealt with the genus several times. In 1900 (Termesz. Füzetek, xxiii, 154–159) he described five species from New Guinea; in 1902 (Mittheil. Zool. Mus. Berlin, ii, 110) he adds one from Egypt; in volume iii of the Palaearctic Catalogue (1907) he lists two European and several eastern species. In 1913 (Annales Mus. Nat. Hung., xi, 529–541) he discusses the genus at some length, on the basis of abundant African and oriental material, describing six more species and recognizing *Coenosia laeta* Wied. as a prior name for one of his own earlier ones.

Meanwhile, Grimshaw in 1902 (Fauna Hawaiiensis, Dipt., 41) had described *Acritochaeta pulvinata* new genus and species from Hawaii, regarded as a subgenus by Stein.

This is all the literature known to me, embodying about 18 species, of which two are European, the remainder essentially oriental in distribution, but covering a wide range from Africa to Hawaii. Nothing, I believe, has been published on habits, and there is no reference to any American occurrence.

Grimshaw's species, which I would call *Atherigona pulvinata*, has come to me for identification as a fruit insect several times in recent years, and has a wide distribution in tropical and subtropical America, as well as in the Pacific Islands, as shown by the following records, in which A indicates material

in my collection and that determined by me in past years, and NM additional records from specimens in the National Museum:

Havana, Cuba, sent me by C. F. Baker about 1898. A.

Florida, breeding in bell peppers, the specimens intercepted in California by the Board of Horticulture. A.

Rarotonga, Cook Ids., in avocados, intercepted by California Board of Horticulture. A.

Fiji, bred from decaying fruit (Compere, Cal. Bd. Hort.) A.

Hongkong, bred from Chili peppers (Compere, Cal. Bd. Hort.). A.

Nadji, Fiji (Illingworth). A.

Pernambuco, Brazil, 1-3-1883, no other data; the earliest American record so far known. NM.

Tampico, Mexico, bred from rotting oranges and tangerines, D. L. Crawford, 1913. NM.

Turner, Florida, bred from tomato, 1907. NM.

Hermosillo, Mexico, from pupæ in injured orange, R. S. Woglum. NM.

Biscayne Bay, Florida, Mrs. Slosson; this undated specimen was probably taken almost as early as Baker's Havana ones. NM.

Miami, Florida, F. Knab, 1912. NM.

Falls Church, Virginia, Banks; no date, but probably collected at least ten years ago. A.

Alhajuella, Panama, 1917, Busck. NM.

La Chorrera, Panama, 1912, Busck. NM.

Trinidad R., Panama, 1912, Busck. NM.

Las Cascadas, Canal Zone, Panama, Jennings. NM.

Galapagos Islands, Charles Island, 1899. NM.

San Francisco Mountains, Santo Domingo, 1905, Busck. NM.

Honolulu, Hawaii, bred from alligator pears and bell peppers, Back, 1912. NM.

Honolulu, Hawaii, bred from umbrella tree nuts, H. P. Severin. NM. A.

Honolulu, Hawaii, in lily bulbs, Cal. Bd. of Horticulture. A.

Dr. E. A. Back, who bred many specimens, tells me that he does not regard the species as an important fruit insect, but rather as a scavenger; and Mr. O. H. Swezey confirms this view. But it is certainly remarkable that so many rearing records have accumulated.

In order to make the genus and species recognizable, the following descriptions are offered:

Genus *Atherigona* Rondani

Described from Italian specimens, determined by Bezzi,

of the types species *varia*. Head high and short, front nearly horizontal, antennæ inserted high and partially concealed in profile in a deep facial excavation which extends to the edge of the mouth; lower edge of head about as long as the front, giving the head in profile a nearly rectangular form, the anterior and posterior sides almost parallel; third joint of antenna long and wide, reaching almost to the vibrissæ, which are at oral margin, arista bare. Eye of peculiar shape, elongate vertically with anterior and posterior margins parallel for some distance, its lower edge almost reaching edge of mouth, so there is only a very narrow bucca or "cheek;" parafacial also very narrow, with a sharp edge bounding the deep facial excavation; front parallel-sided, of equal width in both sexes, with a single row of five bristles on each side, which extend only to the antennal insertion. Ocellars normal, a pair of small hairs behind them, then a pair of good-sized divergent post-verticals. The usual two pairs of verticals, proboscis small, palpi of ordinary size.

Thorax rather narrow, with large humeri, chaetotaxy as follows: dorsocentrals four behind and two before the suture, but all very small and hardly distinguishable except the hindmost two, humeral 3, posthumeral 1, presutural 1, notopleural 2, prothoracic 2, mesopleural only 1 large and 2 smaller along hind edge, sternopleural 3 in an almost equilateral triangle, supraalar 1, prealar indistinguishable, intraalar 1 and a couple of hairs, postalar 2, prescutellars only a minute pair, anterior acrostichals in a double row but irregularly widening backward; scutellum bare below. Hind calypter much exceeding front one, as in *Coenosia*.

Wing as in *Coenosia*, but the anterior crossvein before the end of the first vein, barely beyond end of auxiliary; costa somewhat bowed before tip of auxiliary, widening the costal cell; sixth vein does not reach margin.

Legs with one noteworthy feature—the front femur lacking the usual row of bristles on outer lower edge, bearing only one near the tip.

Atherigona pulvinata Grimshaw.

Has all the characters enumerated as generic, but the small dorsocentrals appear to increase by one before and behind, making the formula 5, 3; the anterior acrostichals also begin with three rows, increasing irregularly to five. Lower sternopleural farther back.

Male. General color opaque gray, mesonotum and most of the pleura and back of head black in ground color, the remainder yellow. Antennæ blackish apically, reddish at base, third joint about four times the second; arista thickened on basal two-fifths, its penultimate joint rather distinct; palpi brownish-yellow, long; upper four or five of the row of post-ocular cilia stout, upcurved.

Humeri and most of scutellum yellow; small hairs of mesonotum rather coarse and scattered, scutellum with long apical pair, two lateral, one small discal, lower sternopleural almost below the hind one but not approximated to it; calypters white, halteres light yellow.

Abdomen yellow, broad at base and abruptly tapering, curved downward; first two segments large dorsally, the second tergite broad on its deflected edges, covering the corresponding part of the much smaller third and fourth segments. Dorsally the first segment has a pair of large, vague, brown discolorations, the second a pair of widely separated roundish black spots behind the middle, the third a similar pair not so much separated and smaller, the fourth a pair of the same size but closer together, all deep black on yellow ground. The small hypopygium is bent forward, its margin notched and blackened below, the homology obscure.

Legs and coxæ yellow, front legs infuscated from tips of femora; middle and hind tarsi black at base, somewhat paler apically; hind tibiæ a little infuscated. Front femur with a tuft of short, soft hairs above just at tip; front tibia without bristles, mid with one small behind near middle, hind with one small on outer hind side just below middle and one each on outer front and inner hind side at a slightly lower level. Claws and pulvilli short.

Wings hyaline; third vein curving backward before tip so that it ends very slightly behind the extreme apex; hind cross-vein straight.

Female. Front legs much more infuscated, only the coxæ and base of femora yellow, front femur not with tuft; tarsi black; palpi widened and considerably blackened, prominent. Abdomen normal, with four pairs of spots; those on first and second segments triangular and brownish, the other two pairs smaller, roundish, black; a trace also of a dark median stripe.

Length, 3.1 to 3.7 mm.

Described from many Hawaiian specimens.

As already stated, there are no published references to the early stages that I know of. I have seen no larvæ; but puparia

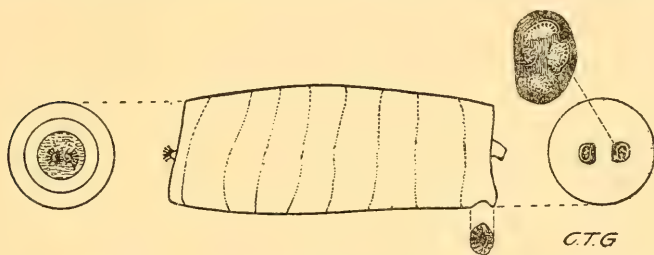


Fig. 2—Puparium of *Atherigona pulvinata* Grimsh. Viewed from the left side. Anterior end shown at left and posterior at right; the larval anal opening below at right end, and the posterior spiracle more enlarged above at right. (Drawn by C. T. Greene.)

are pinned with several of Mr. Back's Hawaiian specimens, and with one of Woglum's from Hermosillo, Mexico. From the latter, Mr. C. T. Greene very kindly made me a drawing (fig. 2), showing its singular characters; the Hawaiian specimens show no differences.

Instead of forming an elliptical body, the puparium is truncated at both ends, like a barrel, only longer in proportion. The anterior end has a distinct circular rim but little smaller than the diameter at middle of body; the anterior spiracles are not located behind the rim as one would expect, but are drawn in nearly to the center of the flat anterior disk, as figured. Other characters are as figured.

I have seen only *varia* and *pulvinata* in this genus, and do not detect any important subgeneric characters for *Acritochaeta*. *Varia* has a little smaller palpi, its hind crossvein is more erect, and its third vein is not bent back toward the tip. The abdomen of *varia* male is peculiar, consisting apparently of three segments plus a large hypopygium; as the Museum possesses but a single male, I am unable to make a thorough study of this. The abdomen of *varia* female, however, is like that of *pulvinata*.

NOTE.—In Proceedings of the Washington Entomological Society, vol. 21, 1919, p. 106, I established a new Anthomyiid genus with the name *Pergandea*. This being preoccupied in Hemiptera, I now substitute GANPERDEA, new name.

THE FIRST SABETHES LARVA FOUND

(Diptera, Culicidæ)

BY J. BONNE-WEPSTER AND C. BONNE

October, 1920, at Moengo, Surinam, we discovered in the water of a hole in a fallen tree a few predacious Sabethine larvæ, feeding on *Culex coronator* Dyar and Knab, *Culex bonneæ* Dyar and Knab, *Culex mollis* Dyar and Knab and even *Uranotaenia lowii* Theobald. The water contained many green algæ. To our great surprise we bred from these larvæ three females of *Sabethes bipartipes* Dyar and Knab.

Sabethes bipartipes Dyar and Knab.

Larva: Head broad. Lower head-hairs single, upper double; both pairs slight. Antennæ cylindrical, rounded, smooth, a slight tuft of two hairs on outer fifth. Mental plate narrow, with a big ventral tooth and eight smaller ones on each side. Maxillæ conical, with one strong big horn at tip and seven teeth on one margin; a stout rod-like hair present near tip. Comb of eighth segment rather irregular number of nine to sixteen simple spines on a strip of chitin. Air tube conical, spicular, two and a half times as long as wide; a few small, irregularly placed hairs present, two strong hooks at tip. Anal

segment with plate reaching half way down sides; a tuft of two long hairs at ventral angle of plate, a subventral tuft of two hairs, dorsally a tuft of two hairs and a multiple tuft. Anal gills broad, bluntly rounded, little longer than anal segment.

Pupa: Breathing trumpets short, conical. Multiple tufts on seventh and eighth abdominal segment. Paddles small.

Larva and pupa are typical Sabethine. They come nearest to *Sabethinus*, from which they differ by the absence of the abdominal hooks.

NOTE ON SCHIZURA APICALIS G. & R.

(*Lepidoptera*, *Notodontidæ*)

Lately Mr. William Beutenmüller describes the larva of this species from specimens feeding on wax myrtle (The Lepidopterist, iii, 133, 1920). The larva is evidently the same as described by me eleven years ago (Proc. Ent. Soc. Wash., xi, 104, 1909), not bred, although supposed to belong to the species. My supposition has thus been verified after this lapse of time. My specimens were feeding on low-bush blueberry. The range of the species is from Maine to Florida.

HARRISON G. DYAR.

CHANGE OF PREOCCUPIED NAME

(*Lepidoptera*, *Noctuidæ*)

For *Bryophilopsis* Dyar (Ins. Ins. Mens., viii, 190, 1920), not Hampson (Moths of India, ii, 361, 1894), the name *Parabryophila* is proposed.

HARRISON G. DYAR.

TWO NEW CULEX FROM COSTA RICA

(Diptera, Culicidæ)

BY HARRISON G. DYAR

Culex (Choeroporpa) pasadaemon, new species.

The adult does not differ in coloration from *C. dysmathes* D. & L., of which a long description has been published (Ins. Mens., ix, 47, 1921). The structure of the side pieces, clasper and lobes of the male hypopygium is also the same; but in the basal parts the mesosomal plate has a more sharply rounded and smooth projection, while the basal hooks are broadly spatulate, not curled.

Type, male, paratypes male and two females, No. 24083, U. S. Nat. Mus.; San José, Costa Rica, January 5, 1921 (A. Alfaro).

This may be a local form of *dysmathes* from Panama. The larvæ of the two remain to be compared.

Culex (Choeroporpa) merodaemon, new species.

Coloration of *pasadaemon*, *dysmathes*, *holoneus*, *alfaroi*, etc. The male hypopygium has the structure of that of *pasadaemon*, except that the mesosomal plate has a long attenuated termination without marginal expansion. The basal hooks are spatulate and not curled.

Thirty-two specimens, type No. 24082, U. S. Nat. Mus.; Orotina, Costa Rica, December 20, 1920 (A. Alfaro).

The structure differs perceptibly from that of *pasadaemon*, which occurs in the same country. The distribution of these peculiar little mosquitoes must be quite restricted, as each locality gives different forms, although the distance may not be very great.

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THE GENUS HAEMAGOGUS WILLISTON

(Diptera, Culicidæ)

By HARRISON G. DYAR

The genus *Haemagogus* proves to have been inadequately treated in the monograph (Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 1917). It was not realized that the ordinary criteria of structure and coloration were not diagnostic for these forms. As a matter of fact, the females of many of the species are practically indistinguishable, whereas the male genitalia show marked characters. This fact was lost sight of in the monograph, because the species were classified first by the females and then a male of each supposed species was mounted for examination and figuring. The result seemed complete; but really several species passed unnoticed by this method. The disadvantage resulting from more careful examination is that some of the older species cannot be recognized at present, being described from females and no male being at hand from the type localities.

The genus divides into two subgenera, *Haemagogus* proper (= *Cacomya* Coquillett), in which the claws of the female are simple and the palpi of the male short, and the more generalized *Stegoconops* Lutz, in which the claws of the female are toothed and the palpi of the male long. The genus is obviously specialized off from *Aedes*, and in *Stegoconops*, the claw and palpal structures usual in *Aedes* are retained.

In Panama, the only locality from which abundant material is at hand, five *Haemagogus* occur, one *equinus* of general distribution, two, *lucifer* and *chalcospilans*, inhabiting the Atlantic coast, and two, *argyromeris* and *gladiator*, inhabiting

the interior and Pacific watershed. The four latter species are known only from Panama.

TABLE OF SPECIES BY THE MALE GENITALIA

Stem of claspette thick, but nearly uniform.

Stem of claspette slightly hairy; filament broadly expanded, leaf-like, strongly ribbed.....*equinus* Theobald

Stem of claspette densely hirsute; filament narrowly expanded, thick on one edge, delicately ribbed.....*panarchys* Dyar

Stem of claspette slender, crooked and variously modified.

Clasper long, spine small.

Scales on side piece mostly broad, straight.

Claspette angled and more or less enlarged near middle, but the tip slender.

Claspette filament narrow, blade-like, thickened on one edge*regalis* Dyar & Knab

Claspette filament triangularly expanded, ribbed at base*iridicolor* Dyar

Claspette slightly enlarged at tip, the filament small, arising from an angle of tip.

lucifer Howard, Dyar & Knab

Claspette strongly thickened at tip, club-shaped, the filament broadly expanded, furcate.

Claspette filament with the arms short and equal; spine of clasper nearly terminal.....*gladiator* Dyar

Claspette filament with the arms long, unequal, one slender and pointed; spine of clasper on one side of tip.....*argyromeris* Dyar & Ludlow

Scales on side piece irregular, mixed with crooked spines,

chalcospilans Dyar

Clasper shorter, the spine one-third its length....*janthinomys* Dyar

Clasper short, the spine one-half its length.*albomaculatus* Theobald

Haemagogus (Stegoconops) equinus Theobald.

Haemagogus equinus Theobald, The Ent., xxxvi, 282, 1903.

Aedes philosophicus Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 190, 1906.

Aedes affirmatus Dyar & Knab, Proc. Biol. Soc. Wash., xix, 164, 1906.

H. equinus was described from Jamaica from two females with toothed claws. No male has been described; but as *H. philosophicus* D. & K. ranges from Mexico to Trinidad, and is the only species with toothed claws in the female known

in this latitude, it is probable that the Jamaican form is the same. The type locality of *philosophicus* may be restricted to Tehuantepec, Oaxaca, Mexico, Knab's breeding number 295, the type being a male, figured in the monograph, plate 23, figure 162. The type of *affirmatus* may be restricted to the locality Salina Cruz, Oaxaca, Mexico. No male is at hand from this locality; but as it is not far distant from the former, this synonymy, previously established, may be confirmed.

Typical males are before me from Miraflores, Canal Zone, Panama, May 9, 1908 (A. H. Jennings), and Tobago Island, West Indies, July, 1905 (A. Busck). Females with toothed claws also are before me from Trinidad, B. W. I. (F. W. Urich and A. Busck). Intermediate localities indicated by females with toothed claws are: Port Limon, Costa Rica (F. Knab); Las Loras, near Puntarenas, Costa Rica (F. Knab); San José, Costa Rica (F. Knab); Paramaribo, Surinam (J. Bonne-Wepster); Georgetown, British Guiana, "Schepmoed," January 29, 1906 (E. D. Rowland); Rupenuni, British Guiana (K. S. Wise).

The larva is described in the monograph as *equinus* (vol. iv, 873, 1917), Knab's breeding numbers 295 and 318, but no figure was published.

The larvæ occur in the water in holes in trees.

Haemagogus (Stegoconops) capricornii Lutz.

Haemagogus capricornii Lutz in Bourroul, Mosq. do Brasil, 66, 1904.

Described from Brazil from females only. The male is unknown, and I have none from anywhere near the locality. It is highly probable that this is a synonym of *H. equinus*, since species with as wide a range as that commonly extend also to Brazil. However, in the absence of the male the name is temporarily held apart.

In the monograph we recognize *capricornii* from the Canal Zone and Trinidad and state that the male has short palpi, figuring the hypopygium of the supposed male on plate 24, figure 165. The male figured is from Trinidad (F. W. Urich, breeding number 17), but there exists no reason for associat-

ing with it females with toothed claws as we have done. Ulrich's No. 17 contains only males; but his Nos. 21 and 22 are females with simple claws. Our females of *capricornii* are really *equinus*, and our supposed males of *capricornii* are referred to below under the caption *Haemagogus janthinomys*, new species. It is common for more than one species of *Haemagogus* to occur in the same locality, even occurring together in the same culture. This was obviously the case in Mr. Ulrich's experience and it should not have caused us to make the serious mistakes which are incorporated in the monograph.

***Haemagogus (Stegoconops) panarchys*, new species.**

Proboscis of the male very long, thickened on the basal half, the apical half thin and curved; palpi slender, about three-fourths as long as the proboscis; antennæ plumose, the last two joints long and slender. Claws of the female toothed on front and middle legs; second marginal cell shorter than the second posterior cell. Abdomen projecting ventrally on seventh segment, most markedly in the male. Coloration, head and mesonotum brilliant blue-green; sides of head and thorax bluish silvery; abdomen violet blue, with silvery patches at the bases of most of the segments; venter with the basal thirds of the segments silver. Legs blue-black, the femora white beneath toward base. Wings smoky tinged, the scales black.

Male hypopygium. Side piece three times as long as wide, conical, a small rounded hirsute lobe at extreme base within; inwardly toward tip a group of large lanceolate scales, containing a row of narrow lanceolate scales with setaform bases. Clasper short, slender, curved, with a terminal spine which is three-fourths as long as the clasper itself. Claspette greatly thickened, curved, uniform except for a notch at outer third; dorsal aspect densely hirsute to middle, then a bare space, again hirsute, with a tuft of longer hairs at tip; filament inserted below this terminal tuft, moderately elliptical, strongly thickened on the lower side, the other side finely ribbed on its basal part.

Type, male, paratypes, male and three females, No. 24331, U. S. Nat. Mus.; El Salado, Guayaquil, Ecuador (F. Campos R.). The specimens bear Prof. Campos's numbers, 24, 25, 26, 69, 70, No. 24 determined by Knab as *albomaculatus* (but the claws are toothed!), No. 26 determined by Knab as *equinus*, and No. 69 determined by Dyar as *equinus*.

Close to *equinus* Theob., but the palpi of the male somewhat longer. The hypopygium is very distinct.

The larva was not sent in.

Haemagogus (Haemagogus) regalis Dyar & Knab.

Haemagogus regalis Dyar & Knab, Proc. Biol. Soc. Wash., xix, 167, 1906.

Stegoconops albomaculatus Howard, Dyar & Knab (not Theobald), Mosq. No. & Cent. Am. & W. I., ii, pl. 23, fig. 163, 1912.

Described from Sonsonate, Salvador, San Juan, Trinidad, Cacao, Guatemala, and Livingstone, Guatemala. The type may be restricted to the first named locality, Knab's breeding number 330. In the monograph, we sunk the name under *albomaculatus* Theobald and cited a wide distribution, no wider, however, than in the original conception. As a matter of fact the species is a local one, and is before me only from Sonsonate, Salvador. The specimen from Trinidad is *janthinomys*, while the two from Guatemala are females and cannot be placed. The male hypopygium is figured in the monograph, as cited above.

The larva was confused by us with that of *argyromeris* D. & L. (*albomaculatus* H., D. & K., not Theobald), but did not serve as the subject of figure or description in the monograph.

Secondary abdominal hairs long and sparsely stellate (3 or 4 in a tuft); air-tube short and thick, rounded at tip, the pecten reaching distinctly beyond the middle, followed by a three-haired tuft; lateral comb of the eighth segment of many scales in a patch, each scale large and thick, smooth on the sides, very minutely feathered at the tip; anal segment with the plate reaching well toward the ventral line, spinose on posterior edge; upper head-hair single, lower double.

From Knab's breeding number 330, "larvæ from water in cocoanut husks, August 30, 1905."

Haemagogus (Haemagogus) iridicolor, new species.

Head and prothoracic lobes dark violet or blue, changing with the incidence of the light; mesonotum green or blue; abdomen dark violet, in some lights with a coppery reflection, with basal segmental silvery white lateral spots, which form a continuous band on the basal segments, no silvery marks dorsally; legs dark violet to bronzy brown, the femora silvery below; wing scales dark; second marginal cell very slightly longer than the second posterior cell; claws simple in the female. Palpi of male about one-sixth of the long proboscis.

Male hypopygium. Side piece about three times as long as wide, the tip rounded; base somewhat swollen inwardly, with a large reticulated area bearing minute setæ; at the side of this a small setose rounded lobe; scales on the outer half of the inner margin, broad, dense, with pointed tips, all straight; a small tuft of setæ at the tip within. Clasper moderate, slender, swollen a little before tip, the spine thickened and appendiculate, inserted nearly its own length before the tip. Claspette with slender sinuate stem, bearing three setæ near base; incurved, bent, thence thinner and with slight transverse wrinkles; filament broadly inserted, broadly circularly triangular, irregularly ribbed, the ribs broad at base, narrower outwardly, becoming oblique and finally transverse at the outer margin. Tenth sternite narrow, long, with revolute margins, the tip minutely dentate, with many teeth. Aedoeagus conical. No ninth tergites.

Types, two males, paratypes, 8 males and 7 females, No. 24332, U. S. Nat. Mus.; Higuito, San Mateo, Costa Rica (Pablo Schild); "in bamboo joints," Alajuela, Costa Rica. May 26, 1921 (A. Alfaro).

The larva figured in the monograph as "*Stegoconops lucifer*" (vol. ii, pl. 77, 1912), and described as "*Haemagogus splendens*" (vol. iv, 866, 1917) probably belongs here. Mr. Knab brought living specimens from Costa Rica, from which he

made his drawing. These came from Port Limon, but the adults are unfortunately all females.

Larvæ from cacao husks and an old kerosene tin.

Haemagogus (Haemagogus) lucifer Howard, Dyar & Knab.

Stegoconops lucifer Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., ii, pl. 23, fig. 164, 1913.

While the monograph was in press, we were informed by Mr. F. W. Edwards that the types of *Haemagogus splendens* Will. had setæ upon the postnotum. We supposed, therefore, that *Haemagogus* must be a Sabethid genus, and we therefore used the new name *lucifer* for the specimens before us that we were treating as *Haemagogus splendens*. This name appears in the volume of plates, although we were able to suppress it in the final treatment of the genus, which did not appear until five years later. The name *lucifer*, therefore, depends upon the published figure, which was made from a specimen from Tabernilla, Canal Zone, Panama (A. H. Jennings, breeding number 399), and this locality becomes the type locality.

The species is locally abundant on the Atlantic coast of Panama, but does not extend far inland. Only three localities are before me, from Tabernilla, many specimens collected by Jennings and Busck; Lion Hill, Canal Zone, Panama (A. Busck); Caldera Island, Porto Bello Bay, Panama, May 23 and August 12, 1908 (A. H. Jennings).

The larva figured as of this species in the monograph (vol. ii, pl. 77, 1912) does not belong to it.

The larva (Jennings, No. 392) has the secondary abdominal hairs strongly stellate (tufts of 7 to 9); skin glabrous; lateral comb of the eighth segment of many scales in a rather small triangular patch, the single scale thick, long, smooth on the sides, and only obsoletely feathered at the tip; air tube moderately short, tapered at tip, the pecten not reaching the middle, of long spines, in a slightly curved row, followed by a two-haired tuft; anal segment scarcely half encircled by the plate, which has an irregular edge; a small triangular plate beside the ventral brush.

Larvæ from water in tree-holes and bamboo-joints. Mr. Jennings has six records from tree-holes (Nos. 249, 261, 331, 335, 374, 295) and four from bamboo traps (392, 398, 399, 461); Mr. Busck has four records from tree-holes (127, 128, 173, 174), two from bamboo (166, 200), one from a wooden box near a house (201), one from a tree stump (149), and one from a hole in a banana stem (155).

Haemagogus (Haemagogus) gladiator, new species.

Head and mesonotum green, abdomen blue or violet, pleuræ, sides of head and lateral abdominal spots silvery; dorsally on the abdomen with distinct silvery bands at the bases of the segments; legs dark violet to black, the femora silvery beneath. Second marginal cell longer than the second posterior cell. Claws of the female simple. Palpi of male about one-fifth as long as the proboscis.

Hypopygium. Side piece three times as long as wide, the basal granular area small, with one seta in it; a slight setose prominence at extreme base; scales on the outer half of inner margin both long and narrow and short and broad; all symmetrical and not mixed with spines; a group of short setæ at tip. Clasper moderate, swollen apically, the spine still terminal, although the enlargement is eccentric. Claspette with slender sinuate stem, enlarged into a disk at tip, minutely pilose and with one seta on the margin; filament reflexed, cleft, the two points similar and about equal in length, both short. Tenth sternites narrow, large, the tip thickened and hooked, minutely dentate. Ninth tergites undeveloped.

Type, male, paratype, female, No. 24340, U. S. Nat. Mus.; Corozal, Canal Zone, Panama, November 30, 1909 (A. H. Jennings, breeding number 39).

Larvæ from "tree hole near Kraft's house." Head hairs, upper single, lower in twos; body glabrous; short abdominal hairs distinctly stellate (tufts of 5 to 7); comb of eighth segment of many scales in a triangular patch, single scale long, thick and rounded, smooth on the sides with minutely feathered tip; air tube short with conical tip, the pecten not reaching

the middle, followed by a four-haired tuft; anal segment about three-fourths encircled by the plate.

Haemagogus (Haemagogus) argyromeris Dyar & Ludlow.

Haemagogus argyromeris Dyar & Ludlow, The Military Surgeon, xlviii, 679, 1921.

This species is abundant and the only common *Haemagogus* with simple claws in the female native to the Pacific side of the Isthmus of Panama. Since the building of the canal, it has extended its range toward the Atlantic, late specimens being taken as far as Gatun. The following localities are before me, the year of capture in this case being unusually important: Taboga Island, Panama, 1908 (A. H. Jennings); Panama City, Panama, 1908 (A. H. Jennings); Corozal, Canal Zone, Panama, November, 1918 (J. Zetek); Miraflores, Canal Zone, Panama, May 9, 1908 (A. H. Jennings); Paraiso, Canal Zone, Panama, April, 1918 (J. Zetek); La Pita, Canal Zone, Panama, June 20, 1921 (through Dr. Ludlow); Empire, Canal Zone, Panama, May 18, 1908 (A. H. Jennings); Pedro Miguel, Canal Zone, Panama, August 9, 1919 (J. Zetek); Ancon, Canal Zone, Panama, July 17, 1908 (A. H. Jennings); Rio Chagres, Panama, May 20, 1907 (A. Busck); Las Cascadas, Canal Zone, Panama, May, 1907 (A. Busck); Spillway, Gatun, Canal Zone, Panama, August 23, 1912 (J. Zetek); Gatun, Canal Zone, Panama, December, 1913 (H. R. Trask).

The male hypopygium is peculiar in the structure of the claspette, the stem of which is enlarged into a flattened club, on which the filament is reversed, cleft, forming two retrose points.

The larva is described in the monograph under the name "*albomaculatus*" (vol. iv, 870, 1917) and figured (vol. ii, pl. 126, fig. 439), specimens being before me Jennings, breeding number 38, Dunn, breeding number C-48, and Zetek, breeding number 1057.

Jennings' specimens were bred from tree-holes, Dunn's from "a flower-pot in a garden at Corozal," while Mr. Zetek's notes confine themselves to the entry "*Haemagogus*."

Further records are at hand, though not in every case tested by males, as follows: Tree-holes, Jennings, Nos. 27, 28, 38, 288, 210, 303, 374, 393, 394; Busck, No. 102; Zetek, No. 666; miscellaneous receptacles, "trunk of large fallen tree" (Jennings, 55), "from container" (Jennings, 118), "from old kettle" (Jennings, 48), "food material from some point on line south of Paraiso" (Jennings, 74), "wooden box" (Busck, 201), "old machinery" (Busck, 221), "pot-holes on Taboga Island" (Busck, Nos. 182, 206). On two occasions Jennings took the larvæ from a stream (Nos. 379, 387); but he noted that "undoubtedly" they had been emptied there from some container, as a washerwoman was at work at the stream. Less typical are three occurrences noted by Jennings: "Paraiso, from cut, with *Anopheles* and *Uranotaenia*" (Nos. 30, 31), "Ancon Boulevard, no oil" (No. 52) and "pool" (No. 111). These were evidently ground pools, and while No. 111 is a female and need not detain us as it may be *chalcospilans* of normal occurrence, Nos. 30 and 52 contain males which are undoubtedly *argyromeris*. We have therefore the occasional occurrence in ground pools when these are of artificial production.

Haemagogus (Haemagogus) chalcospilans, new species.

Head and prothoracic lobes dark violet, mesonotum green, abdomen dark violet, with the usual play of colors; scales of pleuræ silvery white; abdomen with lateral silvery patches, conjoined toward base and forming more or less complete dorsal bands posteriorly. Wing scales dark, the second marginal cell longer than the second posterior cell. Claws of the female simple; palpi of the male about one-sixth the length of the proboscis.

Hypopygium. Side pieces three times as long as wide, rounded at tip; basal area swollen within, with a large minutely pilose area bearing very small setæ from tubercular bases; a small setose rounded lobe at extreme base; scales on distal inner area of side piece crooked, enlarged on one side, mixed with narrow crooked spines and at the tip a tuft of curved setæ; a second tuft of smaller setæ at the tip out-

wardly. Clasper moderate, scarcely enlarged at the base, the tip curved a little; spine terminal, not more than one-sixth as long as the clasper. Claspette slender, sinuate with three setæ at its base, widening outwardly to a single seta; filament apparently continuous with the stem, greatly enlarged and irregularly lobed, forming a long wide conical point at one side and a small fish-tail at the other. Tenth sternites narrow, moderate, the tip with a little rounded knob and group of very fine teeth. Aedoeagus conical. Ninth tergites undeveloped.

Type, male, paratypes, male and two females, No. 24334, U. S. Nat. Mus.; Caldera Island, Porto Bello Bay, Panama, March 22, 1908 (A. H. Jennings, breeding number 247). Also the same locality, February 14, 1909 (A. H. Jennings, breeding No. 490).

The species is not confined to the Atlantic coast, specimens having been taken at Panama City, Panama, December 2, 1907 (A. H. Jennings, No. 48); Ancon, Canal Zone, Panama, December 2, 1907 (A. H. Jennings, No. 43), and Ancon, Canal Zone, Panama, August 15, 1918 (collector unknown, through Dr. C. S. Ludlow).

Mr. Jennings bred the larvæ in three instances (Jennings, Nos. 163, 247, 490) from salt pools in rocks near the sea-coast, and once from an old kettle (Jennings, No. 48). The data with the specimens lately taken at Ancon are unknown to me; but Jennings bred a single male at Ancon (Jennings, No. 43) "from a spring." Jennings also bred what is probably this species from a salt pool (No. 246), from a brackish pool (No. 262), and from a pool beside a stream with *Anopheles eiseni*; but in these latter cases the rearings are all females, or the male has been broken. A single male (Jennings, No. 261) "from open tree-hole beside lower course of reservoir stream" is probably not an exception to the ground-pool habit.

The larva (Jennings, No. 163) has the head subcircular, mouth pointed, brushes moderate only; antennæ small, smooth, with a single hair near the middle; eyes small, round, black. Skin granular-glabrous; secondary hair tufts long, weakly stellate (3 to 4 hairs), stout and distinct; lateral comb of the

eighth segment of many scales in a large triangular patch, four or five scales deep; basal scales small, becoming larger progressively posteriorly, the terminal scales longest, smooth on the sides, with expanded, minutely feathered tips, all small and weakly colored; air-tube about one-and-a-half times as long as wide, tapered on the outer half; pecten not reaching the middle, of closely set spines in a slightly oblique row; anal segment three-fourths encircled by the plate, a little expanded terminally, the anal gills short and bud-shaped.

In the monograph, we confused this species under *splendens* Will. We were puzzled by the unexpected and apparently sporadic occurrence of the larva in rock-holes, and were not able to give any explanation of it. It did not occur to us that a distinct species was involved, for at the time of writing the monograph we could not divorce ourselves from the idea that species of mosquitoes must necessarily be separable on characters of adult coloration. That the obvious larval differences between all these forms did not obtrude themselves upon our attention I can only attribute to the fact that the Jennings collections were never fully worked over, owing to Mr. Knab's preoccupation and illness.

Haemagogus (Haemagogus) janthinomys, new species.

Head blue, mesonotum green, abdomen dark purple, with the usual play of colors; pleura silvery scaled; abdominal lateral spots silvery, joined on the basal segments, with more or less silver dorsally also on the posterior segments; legs dark violet to black, the femora white and silvery below toward base. Male proboscis thick on the basal half, the apical portion curved; palpi about one-fifth its length. Claws of female simple.

The male hypopygium is figured as "*capricornii*," plate 24, figure 165 of the monograph.

Types, two males, paratypes, 4 males and 3 females, No. 24335, U. S. Nat. Mus.; Trinidad, B. W. I. (F. W. Urich, breeding Nos. 17, 21, 22, B1, B3); June, 1905 (A. Busck).

The larva is described in the monograph under the name

"*capricornii*" (vol. iv, 877, 1917) and also figured (pl. 126, fig. 438, 1912).

The larvæ were bred from tree-holes.

Haemagogus (Haemagogus) albomaculatus Theobald.

Haemagogus albomaculatus Theobald, Mon. Culic., iii, 308, 1903.

Described from a single female with simple claws from British Guiana, probably from the Pomeroon River. In the monograph, we sink *regalis* to this species, and record it from Central America, Panama, and Trinidad. It will be necessary to reverse this synonymy because *regalis* (Sonsonate, Salvador) is one species, Panama specimens (Gatun, Canal Zone) are another (*argyromeris* D. & L.), and Trinidad specimens represent a third species (*janthinomys* Dyar). Fortunately specimens are before me from British Guiana (near Georgetown, taken by H. W. B. Moore) representing a fourth species, and to these the name *albomaculatus* may be restricted. It is possible that Theobald's type represents still another species; but this can probably never be established from the female alone, and until that is done, the present restriction will hold.

Male hypopygium. Side piece conical, about three times as long as wide; basal area small, granular, without setæ, but a single hair basally; a group of long hairs at extreme base, arranged in a line; inner area almost to the base with long thin scales, mixed with stout setæ, all straight; apex without a hair-tuft. Clasper slender, small, curved, the spine terminal and about half as long as the clasper itself. Claspette moderately slender, curved, with a seta at base, the basal half minutely pilose; strongly chitinized; tip expanded, obliquely truncate, the filament small, pointed, lying on the truncation and projecting beyond its end. Tenth sternites stout, with rounded recurved tips.

The larva was not sent in by Mr. Moore.

Haemagogus (Haemagogus) splendens Williston.

Haemagogus splendens Williston, Trans. Ent. Soc. Lond., 272, 1896.

Described from eight specimens, one said to be a male, from the island of St. Vincent, West Indies. The male characters, however, have never been made known, and therefore the species must remain for the present unrecognized. It is possibly the same as one of the mainland forms; but as the species from Trinidad and British Guiana are different, this cannot be assumed. The specialized species of *Haemagogus* with simple claws in the female and short palpi in the male seem to be all of very restricted distribution. In the monograph we gave *splendens* a very extended distribution, Central America, Panama, Trinidad, St. Vincent and Brazil, which must now be canceled.

ILLUSTRATIONS OF CERTAIN MOSQUITOES

(*Diptera, Culicidæ*)

BY HARRISON G. DYAR

Culex (Choeroporpa) pasadaemon Dyar.

Culex (Choeroporpa) pasadaemon Dyar, Ins. Ins. Mens., ix, 100, 1921.

The male hypopygium, side piece, and basal organs are illustrated in Plate II, figure 1.

Culex (Choeroporpa) merodaemon Dyar.

Culex (Choeroporpa) merodaemon Dyar, Ins. Ins. Mens., ix, 100, 1921.

The basal parts of the hypopygium are illustrated in Plate II, figure 2.

Culex (Choeroporpa) dysmathes Dyar & Ludlow.

Culex (Choeroporpa) dysmathes Dyar & Ludlow, Ins. Ins. Mens., ix, 47, 1921.

The basal parts of the hypopygium are illustrated in Plate II, figure 3.

Culex (Choeroporpa) holoneus Dyar.

Culex (Choeroporpa) holoneus Dyar, Ins. Ins. Mens., ix, 35, 1921.

The basal parts of the hypopygium are illustrated in Plate II, figure 4.



HYPOPYGIUM OF MALE MOSQUITOES

- Fig. 1. *Culex (Choeroporpa) pasadaemon* Dyar, side piece and basal parts.
- Fig. 2. *Culex (Choeroporpa) merodaemon* Dyar, basal parts.
- Fig. 3. *Culex (Choeroporpa) dysmathes* Dyar & Ludlow, basal parts.
- Fig. 4. *Culex (Choeroporpa) holoneus* Dyar, basal parts.
- Fig. 5. *Prosopolepis prolepidis* Dyar & Knab, clasper.
- Fig. 6. *Culex (Helcoporpa) trifidus* Dyar, side piece, basal parts, and ninth tergite.
- Fig. 7. *Sabethoides nitidus* Theobald, side piece and basal parts.
- Fig. 8. *Sabethoides nitidus* Theobald, clasper.
- Fig. 9. *Culex chidesteri* Dyar, mesosome.

Prosopolepis prolepidis Dyar & Knab.

Wyemyia prolepidis Dyar & Knab, Ins. Ins. Mens., vii, 1, 1919.

Prosopolepis prolepidis Dyar, Ins. Ins. Mens., vii, 142, 1919.

Prosopolepis prolepidis Dyar & Ludlow, The Military Surgeon, xlviii, 677, 1921.

The figure of the clasper is repeated from the last reference cited above, Plate II, figure 5.

Culex (Helcoporpa) trifidus, new species.

The definition of the subgenus *Helcoporpa* may be enlarged to include the present form by reading "tip of clasper obliquely elliptically excavate, *or branched*."

Bronzy black, the abdomen with small basal segmental white spots.

Head with flat black scales on vertex, many forked brown ones behind, and a narrow border of white ones along the eye-margins. Mesonotum with fine hair-like dark brown scales. Abdomen bronzy black above, with small segmental white lateral spots; venter dark gray, the segments very narrowly white at their bases. Legs black, the femora white below nearly to the tips; coxæ green. Wing-scales black, narrow, those on the forks of the second vein narrowly ligulate. In the male, the palpi exceed the proboscis by about the length of the last joint, slender, pointed, the last two joints sparsely hairy.

Hypopygium. Side-piece short, subspherical and thick, the end of the abdomen enlarged thereby; lobe near the apex, the outer division shortly notched, with a spatulate leaf, a long hooked filament and a short one; inner division with two filaments with triangular pointed tips, one inserted more basally than the other. Clasper thick, divided into three erect parallel lobes, the center one shorter, the outer one bearing a short appendiculate spine subapically. Tenth sternites comb-shaped, the teeth at the tip divaricate, forming a hook. Mesosome with two long slender straight plates; basal hooks curved; parameres normal, the articulated plate (basal plates?) furcate. Ninth tergites elongated, foot-shaped, with a single seta (Plate II, figure 6, side piece and basal parts).

Types, two males, paratypes, four males and five females, No. 24158, U. S. Nat. Mus.; Escasú, Costa Rica, February 7, 1921, and Tiribí, Costa Rica, January 7, 1921 (A. Alfaro); also Rio Ciruelas, Costa Rica, April 10, 1921 (A. Alfaro).

Sabethoides nitidus Theobald.

Sabethes nitidus Theobald, Mon. Culic., ii, 347, 1901.

Sabethoides nitidus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iii, 37, 1915.

Sabethoides nitidus Bonne-Wepster & Bonne, Ins. Ins. Mens., ix, 2, 1921.

Male. Proboscis long, straight, slender, not swollen at the tip, white below for three-fourths its length. Palpi very short, exceeding the clypeus by about its own length. Antennæ as in the female. Femora more broadly white beneath than in the female on fore legs, the mid-femora white at base and with a bright white area beneath at tip occupying about one-fourth of the joint; first mid tarsal white below; second joint white all around, except for a narrow black dorsal line running two-thirds the length of the joint; third tarsal white at base, the upper side black at tip, the black area beginning as a dorsal line and widening to enclose the whole joint at tip.

Hypopygium. Side piece elliptical, flattened, concave, strongly chitinized on the edges; three setæ within; a rounded triangular plate toward the tip, bearing two setæ and a tooth (Pl. II, fig. 7). Clasper with slender column, triangularly widened and divided into five arms, the supporting limb chitinized; first arm small, slender, recurved, spinose; second stout, with pointed curved tip, three setæ and a short beard; third transverse, long, bar-like, angled outwardly like a bird's wing, bearing long fimbriate cilia throughout; fourth thick, capitate, rugose at tip, bearing inwardly three club-shaped filaments and a pointed one; fifth slender, rod-like, with two groups of long curved cilia at its apex (Pl. II, fig. 8). Tenth sternites with rod-like chitinized edge and dentate tip. Aedoeagus of two paired appendages, toothed at tip, the smaller pair with a plate behind each, giving rise to a triangular-tipped filament. Ninth tergites each with six stout setæ with expanded tips.

Besides the localities given in the monograph, the following may be cited: Dona Maria, Chiapas, Mexico (D. L. Crawford); Guatemala (R. Morales); Matapalo, Costa Rica, January 16, 1921 (A. Alfaro); Higuito, San Mateo, Costa Rica (Pablo Schild); David, Panama, August 10, 1920 (J. Zetek); Rupununi, British Guiana (K. S. Wise).

The fortunate discovery of this long-sought male is due to the indefatigability of Dr. Anastasio Alfaro of the Costa Rican National Museum at San José. Dr. Alfaro met with the species in some numbers, biting by day, and by sweeping in the vicinity, secured the male. Twenty-two specimens were thus taken at Matapalo, and accompanying them were only four other mosquitoes, respectively, *Culex declarator* D. & K. ♀, *Aedes taeniorhynchus* Wied. ♀, *Aedes cuneatus* D. & K. ♀, too much rubbed to be sure, and *Anopheles punctimacula* D. & K. ♂.

In the monograph we suggested that this mosquito was probably predacious in the larval state, on account of its rarity, and only single specimens being caught; but if so, the *Sabethoides nitidus* must have consumed all of their prey in this case, for they were in some numbers and no other Sabethid was flying. The four mosquitoes caught with them are all marsh-pool or ground-pool breeders, and could not have formed the prey of a Sabethid larva. It occurs to us to make the suggestion that this species is predacious on larvæ occurring in cocoanut husks, cacao shells and bamboo joints, such as *Haemagogus*, etc. The specimens taken by Mr. Schild were accompanied by *Haemagogus iridicolor* Dyar, and in Dr. Alfaro's case the suggestion made above may explain the absence of accompanying adults.

***Culex (Culex) chidesteri*, new species.**

Described from two males. Proboscis with a pale whitish band beyond the middle; palpi exceeding the proboscis by more than one length of the last joint, black, the last two joints hairy, a faint pale band on the long joint. Vestiture black, as far as can be seen, both specimens being denuded; in one the tarsi are entirely black, in the other, very faint indica-

tions of narrow pale rings at the joints. The wing scales are rather broadly ligulate, especially on the forks of the second vein.

Hypopygium. Side piece with a subapical lobe, bearing three rods, of which the middle one is stouter, a leaf and a seta. Mesosome thick, cylindrical, the end truncate, slightly excavate, with a row of numerous small even teeth; the upper angle is rounded and covered with short papillose teeth, the lower angle rounded and short; a stout tooth arising from the base of the mesosome in the middle, and exceeding it. Tenth sternites tufted with even spines, with a stout curved basal arm.

The species falls in the table (Ins. Ins. Mens., vi, 94, 1918) with *stenolepis*, from which it differs in the shape and spinulation of the mesosome (Pl. II, fig. 9). In *stenolepis*, also, the tarsal joints are broadly ringed with white.

Types, two males, No. 24716, U. S. Nat. Mus.; Colon, Panama, June 24, 1921, taken on the hospital screens between 7 and 8 a. m. (W. S. Chidester, communicated by J. Zetek).

***Uranotaenia orthodoxa*, new species.**

Head purplish black, with a round silvery blue spot at the vertex; clypeus and tori ochraceous. Prothoracic lobes with bluish silvery scales; mesonotum pale brown, with small black hairs and longer bristles, leaving two narrow bare lines, and a broader space on each side posteriorly; an oblique line of silvery blue scales from the root of the wing forward to the middle of mesonotum. Abdomen black above, dull yellowish below. Legs black scaled, with bluish and bronzy reflections, the femora pale beneath. Wing scales black, a line of bluish silvery ones on the base of the fifth vein.

Type, female, No. 24706, U. S. Nat. Mus.; Tiribí, Costa Rica, May 29, 1921 (A. Alfaro); paratype, female, San José, Costa Rica, May 15, 1920 (A. Alfaro).

Nearest to *U. pallidoventer* Theobald, but the head entirely dark blue behind, without the border of metallic scales.

Single examples occurred in two rearings, all the other specimens being *Culex coronator* in both cases.

NOTES ON HELOMYZIDÆ AND DESCRIPTIONS
OF NEW SPECIES*(Diptera)*

BY C. B. D. GARRETT

The local conditions at Cranbrook, British Columbia, seem admirably adapted to the life of the dipterous family Helomyzidæ, which is borne out by the number of species found here and the great abundance of some. Thus in studying the family I have examined several thousand, and numbers usually tend to show what amount of variation should be expected in each species. The classification of earlier works has been based chiefly on the humeral and dorso-central bristles; but specimens before me show the unreliability of these features, which have also been at least in part the cause of new genera being erected that have fallen as synonyms, and in some cases the dorso-centrals vary as much as 50 per cent and in others from 5 to 15 per cent. Another weak feature of this classification is that the dorso-centrals throw into a single genus two or more insects of quite distinct structure and in some cases three distinct forms of the male genitalia. Thus starting for my own satisfaction a new classification in my cabinets I soon realized its apparent reliability and distinct benefit, so after careful consideration and thought I would offer it for the adoption of others. In collections containing a large number of the North American forms the proposed classification will clearly show how the special types of male hypopygium are thrown in convenient groups, at the same time into distinct genera on other features, a benefit that is not easily overlooked.

The main feature of the new scheme is based on the foremost (next the antennæ) fronto-orbital bristle, and in the hundreds that I have examined in no case did I find it to vary, excepting in one species in which no two specimens seem exactly alike. This species is easily separated by other characters, and cannot be the cause of any trouble. In the genus *Anorostoma* Loew, three American species fall into one genus,

but the fourth splits to another where it can be easily separated on other features.

It may appear that too many new genera are erected, six being proposed. Of these, two species of *Leria* never had any real right in that genus, the structure being so different that both should have had new genera long ago. Again, two species herein described could not fit in any known genus, and would require new genera in any case. The last two are there merely by the features of the classification.

In the near future I hope to revise the North American forms and would ask the loan of all specimens, however few, for the purpose of examination. Any criticism of this paper will be welcome.

PROPOSED NEW CLASSIFICATION

1. Foremost fronto-orbital bristle, longer, equal (or nearly so) to the hind fronto-orbital bristle..... 2
- Foremost fronto-orbital bristle from one-half to three-quarters the length of the hind one..... 4
- Foremost fronto-orbital bristle less than half the length of the hind one; small, hairlike or absent..... 7
2. With prosternal bristles (male hypopygial claspers usually two long curved horns)..... *Leria* Loew
- No prosternal bristles..... 3
3. Lower half of the oral margin with long silky hairs, longer than the vibrissæ; mid tibia with two preapical bristles; costa with a conspicuous bump over the auxiliary vein.. *Barbastoma* Garrett
- Lower half of oral margin with the usual short hairs; mid tibia with only one preapical bristle¹..... *Postleria* Garrett
4. With prosternal bristles (male hypopygial claspers two short irregularly oval horns)..... *Amæbaleria* Garrett
- Without prosternal bristles..... 5
5. Mesopleura bare 6
- Mesopleura with a bristle or two..... *Anorostoma* Loew
6. Mid tibia with very short preapical bristle; a single very long apical spur, much longer than the preapical bristle,
Thephrochlamys Loew
- Mid tibia with several longish apical spurs..... *Morpholeria* Garrett

¹*Anorostoma maculata* Darlington may seem to fall here, in which case it is readily separated by having a mesopleural bristle, wings spotted, and very short vibrissæ and arista.

7. Prosternal bristles present.....No species in America
 No prosternal bristles 8
8. Foremost fronto-orbital bristle absent; hind one very small;
 arista very long (humeral, propleural, sternopleural and hind
 supra-alar absent).....*Porsenus* Darlington
 Not such 9
9. Pteropleura hairy, often with a bristle; scutellum not hairy;
 arista only microscopically pubescent; foremost fronto-orbital
 bristle usually present, hairlike or small.....*Pseudoleria* Garrett
 Not such10
10. Mid tibia with two pre-apical bristles.....11
 Mid tibia with one pre-apical bristle.....12
11. Mid tibia with two or three spines near the middle,
Oecothea Halliday
 Hind femora with two or three irregular rows of spines on the
 outside; eyes small; arista very long.....*Eccoptomera* Loew
12. Mid tibia with only one long apical spur and two short ones;
 tarsi not conspicuously spurred (tarsus 4 elongate; tarsi long,
 as deep as broad).....*Allophyla* Loew
 Mid tibia with several long apical spurs.....13
13. Only one fronto-orbital bristle (arista usually plumose; wings
 usually infuscated; scutellum except in one or two species
 with one or many hairs).....*Helomyza* Fallen
 Usually two fronto-orbital bristles; male with a comb or cluster
 of spines on the inside of the hind femora; scutellum not
 with hairs; wings hyaline; arista microscopically pubescent,
Acantholeria Garrett

Having no knowledge of the fronto-orbital bristles in the genus *Crymobia* Loew, I am unable to place it. There is but one American species, *C. hiemalis* Loew. *Anorostomoides petersoni* Malloch I believe to be a synonym. Some of the generic features are prosternal bristles absent, mid tibia with two preapical bristles.

***Leria aldrichi*, new species.**

Length 3 to 4 mm. One long pair of prosternal bristles. Fronto-orbital bristles equal; four dorso-centrals.

Head. Occiput grayish brown, antennæ to vertex red yellow, face and cheeks yellowish, antennæ 1 to 3 dark red brown, arista medium long, microscopically pubescent. Vibrissæ two, and long hairs in a single row to lower corner.

Thorax. Dorsum, brownish dark. Shades of a median stripe and through the roots of the dorso-centrals darker, sparingly hairy, short. Scutellum brownish.

Pleura. Gray black, propleura one bristle, mesopleura bare, except four hairs below the disk. Pteropleura bare. Sternopleura one bristle, a few hairs along the top edge, center bare and many bristles between the coxæ.

Abdomen. Dark drab brown, sparingly hairy with apical bristles on segments 3 to 5. Hypopygium color of abdomen, outer claspers a plain L, the stem pointed toward the head.

Legs. Black or dark brown; wings hyaline, veins dark. Humeral bristle present.

Female similar to the male.

Described from one male, 4th March. Holotype, allotype and paratypes, three females, taken on 8th, 24th, and 30th March.

All from Cranbrook, British Columbia.

Leria tristissima, new species.

Fronto-orbital bristles equal. Three pairs of short prosternals; four dorso-centrals; one humeral.

Monotype male, length about 3.5 mm.

Head (blackish) brown, vertex to antennæ orange yellow, face and cheeks dark yellow; antennæ one and two red-yellow; three missing; vibrissæ two below with an outer and an inner row of hairs to the lower corner distinctly separated.

Thorax somewhat polished; dark brown, sparingly hairy, all bristles very long. Scutellum brown, dark.

Pleura dark brown; propleura one bristle; mesopleura one long strong bristle on the upper hind edge near the middle; pteropleura bare; sternopleura one large one smaller bristle, and also two incomplete rows of hairs along the top edge, central bare and two or three rows of bristles between the coxæ.

Abdomen black brown, sparingly hairy, but with apical bristles on each segment. Hypopygium red brown, not extended, but will be mounted later on a slide.

Legs: femora dark red brown, tibia and tarsi dark red yellow; wings hyaline not clear; veins dark.

Described from one male from St. Anthony, Newfoundland, 4th May.

It is closely allied to *tristis* Walker, apart from which I consider the mesopleural bristle a good specific character.

Barbastoma, new genus (from Greek *barba*, a beard; *stoma*, a mouth).

Generic characters: Dorso centrals (I think) four small; one humeral, one presutural, two notopleura, only two supra alar, three pair scutellar, no prosternal; mid tibia with two pairs of preapical bristles; wings, costa with a conspicuous bump over the tip of the auxiliary vein, spines few short; small cross vein below tip of auxiliary; vein one very long, tip ending above midway between the two cross-veins; large cross-vein joining vein five at an acute angle; foremost fronto-orbital a little shorter than the hind one (about equal); lower half of oral margin with long silky hairs, longer than the vibrissæ.

Genotype, the following species.

Barbastoma barbatus, new species.

Male. Fronto-orbitals nearly equal, the foremost a little shorter, no prosternal bristles.

Length about 4 mm. Head: occiput gray-black, antennæ to front red-yellow, face and cheeks pale yellow, antennæ dark red-yellow, infuscated; arista very short, less than the length of the head, microscopically pubescent. Vibrissa one very short, from it to halfway two rows of longish black hairs, from there to the lower corner very long golden hairs twice as long as the vibrissæ.

Thorax nearly all darkened by moisture. What is shown is a pale drab brown. The pin has destroyed the sight of the dorso-centrals, one each side of the suture are short; dorsum with sparing hairs which are long, over half of the length of the dorso-centrals. Scutellum with three pairs of lateral bristles, the third about midway between the usual two hairs.

Pleura blackish, propleura one bristle, mesopleura bare, no hairs below the disk, pteropleura bare, sternopleura one long and one shorter about half the size, rest bare except between the coxæ where there are two or three rows of bristles.

Abdomen black brown, hypopygium yellow brown, both with sparing black hairs.

Legs pale red-yellow, fore femora much swollen, tibia of fore and hind with preapical bristles weak, mid tibia with two strong divergent; legs with black hairs. Wings hyaline, costa with a conspicuous bump its height over the tip of the auxiliary vein; spines few, short. Small cross-vein below the tip of the auxiliary vein, vein one very long, ending above midway between the two cross-veins. Large cross-vein joins vein five at acute angle.

Monotype male, taken 14th October, 1919, 3 miles up Sheep Creek from the mouth of Coyote Creek, or at the bottom of the Ram Creek Pass trail, when out hunting. There were heavy frosts, and about this time it went to 15 degrees below zero. Sheep Creek is nearest to Wasa, British Columbia, some 24 miles from Cranbrook, British Columbia.

Postleria, new genus.

Fronto-orbital bristles equal or nearly so. No prosternal bristles. Arista usually short. Otherwise as *Leria* Loew.

Genotype, the following species.

Postleria fuscolinea, new species.

Fronto-orbitals nearly equal, no prosternals, dorsocentral bristles very variable, the first next the scutellum seem always present, and medium sized, the next three being behind the suture present or absent, when present, the first one larger. The presutural one usually present, though small.

Length about 5 mm. Head light brown, a broad dark brown stripe from the antennæ straight through to the occiput, only thin pale margins next to eyes. Cheeks red-yellow, often silvery. Antennæ red-yellow infuscated, arista short black, microscopically pubescent. A basal swelling slightly larger than is usual.

Thorax brown, with four dark brown stripes, two near the center and two lateral of large disconnected oval spots.

Humeral bristle strong. One to five dorso-centrals; dorsum with many short thick black hairs.

Pleura dark brown, lighter in places, propleura always with two bristles, sometimes three. Mesopleura bare except two hairs below the disk. Pteropleura bare. Sternopleura, one strong bristle and six short thick hairs, along the top edge, rest bare except between the coxæ, where there are four or five rows of bristles.

Abdomen dark brown, usually with a thin pale apical edging, with few or many short thick black hairs. Hypopygium yellow brown.

Legs and coxæ, yellow brown, the preapical bristle of the fore tibia short, the hind one longest. Fore femora swollen.

Wings hyaline, veins brownish.

The female is the same as the male.

Described from twenty-four specimens, eight male and sixteen female, one taken 26th May, all others in June at Cranbrook, British Columbia, and one from Michel, British Columbia, 2d August.

The eggs are elongate oval, tips sharp, with longitudinal ridges.

Amoebaleria, new genus.

With prosternal bristles, usually only one, sometimes two pairs. Foremost fronto-orbital bristle from over half to about three-quarters the length of the hind one. Otherwise as *Leria* Loew.

Specimens of this genus are usually large. Five species have a hairy mesopleura, four without. The male hypopygium is large, but the two main claspers are small, and irregularly oval instead of the long hooks of *Leria*. The name is from the Greek *amoeba*, changing, referring to the variability of the dorso-centrals.

Amoebaleria scutellata, new species.

Length 8 mm.; foremost fronto-orbital about three-quarters of the hind one, one pair of prosternals, four dorsocentrals,

one humeral. Occiput gray black, antennæ to front orange-yellow, face and cheeks red-yellow. One strong vibrissa, below a single row of longish black hairs to lower corner, and three of another row next to vibrissæ. Antennæ red-yellow, arista medium long, black, and microscopically pubescent.

Thorax gray black, one thin median red brown stripe, the dorsocentrals rising from small oval spots of the same color. Dorsum with long fine black hair, scutellum gray-black, with brownish shading and lies almost touching the postnotum.

Pleura upper parts brownish, lower gray-black; propleura one bristle, mesopleura bare except about twelve hairs below the disk. Pteropleura bare, sternopleura one strong bristle, the rest entirely covered with long fine black hairs, and bristles between the coxæ.

Abdomen red-yellow, blackish in places, all covered with long fine black hairs, segments two to five with distinct apical bristles.

Legs and coxæ red-yellow, fore femora and some tarsi infuscated, all covered with long fine black hair, shorter and less on the tarsi.

Wings hyaline, veins dark.

Monotype male, 3d May, Cranbrook, British Columbia, 3500 feet.

This species is allied to *fraterna* and *gigas*.

Amoebaleria gigas, new species.

Length 8 to 9 mm., often 4 to 10.

Head, antennæ, thorax, pleura, abdomen, legs pale red-brown; front to antennæ orange yellow. The abdomen occasionally, especially in the female, with blackish gray covering. Arista medium long, black and microscopically pubescent. Vibrissa one strong below, where are three to five rows of long fine hairs to the lower corner; dorsum with three distinct stripes of red brown, the median one sometimes short, the other two through the base of the dorso-centrals, which may be strong or weak, or one to four. Humeral bristle present or absent. Scutellum with two pairs, often an extra bristle.

Pleura, propleura one bristle, rarely two; mesopleura thickly covered with long black hairs except a bare patch from the disk widening to the sternopleura; a bunch of twenty hairs below the disk. Pteropleura centrally near the anterior edge with a square patch of long fine hairs. Sternopleura with one or two strong bristles at top corner, the rest almost entirely covered with long fine hairs, which are longer between the coxæ, but are not bristles.

Abdomen entirely covered with long fine hair; the usual apical bristles are not seen. Male hypopygium, claspers distinct, except perhaps for *Leria tincta* which I have not examined.

Legs thickly and entirely covered with long thin hair, mid tibia spurs curved, wings subhyaline, basal cells yellow, large cross vein slightly infuscated, sometimes blackish.

The female is the same as the male, but the humeral and dorso-central bristles seem always present and strong.

Described from 137 specimens from Cranbrook and Michel, British Columbia, taken in March to August, being 45 male and 92 female. Named *gigas* for its large size.

Morpholeria, new genus (from *morpho*, meaning "wanting form," from *Leria*).

Foremost fronto-orbital bristle from a half to three-quarters the length of the hind one; no prosternal bristle. Otherwise as *Leria* Loew.

Morpholeria melaneura, new species.

Foremost fronto-orbital nearly three-quarters of the hind one; no prosternal bristle; four dorso-centrals, one humeral.

Length about 2.5 to 3 mm. Head: Occiput, gray brown, antennæ to front, orange yellow, face and cheeks red-yellow; antenna dark red brown, arista very short; about two-thirds the diameter of the eye, or as long as the vibrassa, which is longish, and a single row of hairs below to the lower corner.

Thorax drab brown, shades of a dark median stripe, and along the roots of the dorso-centrals; dorsum very sparingly hairy, but regularly.

Pleura black, grayish. Propleura one bristle; mesopleura bare except five or six hairs below the disk; pteropleura bare; sternopleura one bristle, in front of which are a few scattered hairs to the middle of the top edge, then down the center to between the coxæ, where there are many bristles.

Abdomen dark brown or approaching black, with very few hairs and long or median apical bristles on most segments. Hypopygium polished or shiny and type of *Amoebaleria* claspers.

Legs dark brown, femora blacker; wings hyaline; spines few, usually very short.

Described from seven specimens, two males, five females, taken in April, May and October at Cranbrook, British Columbia.

Type male, allotype female.

Pseudoleria, new genus (from the Greek *pseudos*, "false" *Leria*).

Foremost fronto-orbital usually present, small and hair-like, about one-fifth the length of the hind one, but often absent. No prosternal bristles; one humeral; four dorso-central. Head deeper than long, eyes small, arista rather long. Mesopleura bare, except one or two hairs below the disk, pteropleura with four to twelve longish hairs and sometimes a bristle.

Genotype, *P. pectinata* Loew.

Pseudoleria pectinerata, new species.

Type female. Foremost fronto-orbital missing or hair-like; no prosternal bristle, one humeral, four dorso-centrals.

Length about 5 mm. Head brownish, antennæ to ocelli red-yellow; face and cheeks pale brown. One long strong vibrissa, below which are two rows of short even sized hairs to the lower corner. Antennæ dark red-brown, arista rather long, microscopically pubescent.

Thorax pale brown with or without a thin median red-brown stripe almost full length; dorso-centrals rising from round spots of the same color. Dorsum with regular but short thick hairs.

Pleura color of dorsum, but shading darker to sternopleura, where it is blackish or grayish. Propleura one bristle; mesopleura bare, except two strong long hairs below disk. Pteropleura with four to seven longish hairs. Sternopleura one strong bristle, and all covered with fine medium long hair; a row of bristles between the coxæ.

Abdomen gray black, tip slightly edged with yellowish; all segments with regular, short, thick black hair, but segment three on latero-ventral part of the dorsal plate covered with very many close longish black hairs, like a brush. Segments three to six with apical row of bristles.

Legs and coxæ red-yellow, tips of tarsi slightly darker, fore femora infuscated gray-black.

Wings hyaline, veins yellowish, small cross vein not infuscated, which is usually so in *pectinata*.

Described from three females, taken in June at Cranbrook, British Columbia.

Though I have taken many local males they all seem to be the true *pectinata*, which occurs here also, as I have several females too. *Pectinerata* is very close to it, but is larger than local *pectinata*.

Oecothea canadensis, new species.

Only one fronto-orbital bristle, no prosternal.

Length 4 mm. Head brown; front to antennæ yellowish, as are the face and cheeks. One strong vibrissa, below which is a single row of six or seven hairs, the first four long and strong. Antennæ dark red-brown, arista long black, the basal swelling brown, microscopically pubescent.

Thorax brown, darkish, the edges, humeral and scutellum yellow-brown; dorsum with many short thick black hairs, the notopleura bare and near it. Scutellum much raised from the postnotum in lateral view.

Pleura dark brown, the edges of the divisions lighter; sternopleura black brown, with one strong bristle and another weaker; posterior part with scattered short hairs, becoming bristles below the coxæ. Postnotum black-brown.

Abdomen all gray-black; hypopygium yellow-brown, all with short thick hairs; segments two to five with apical bristles.

Legs and coxæ yellow-brown, tarsi slightly darker; mid femora with many strong bristles outside. Mid tibia about the center with one spine on the inside and two outside; two preapical bristles.

Wings hyaline, veins dark brown, large crossvein leaving vein four at more than a right angle, and joining five at an acute angle.

Cell first R, along the center almost equal in depth to that of the cell below R 3.

Described from one male, holotype, 29th March, Cranbrook, British Columbia.

The female taken here but not *in copula* is similar, except that the pleura are a lighter brown, the second sternopleural bristle is only a long hair, abdomen two to five dark brown, edge paler. The large crossvein as in the male, but from the center to vein four it is curved, thus leaving four at nearly a right angle.

Two females, allotype and paratype, 28th April, Cranbrook, British Columbia; 28th July, Michel, British Columbia.

Acantholeria, new genus (from the Greek *akantha*, spined, and *Leria*).

Foremost fronto-orbital missing, hair-like, or about one-third of the hind one, very rarely in the female nearly a half. No prosternals; four large strong dorso-centrals, etc. Males with a bunch or a comb of spines on the inside of the hind femora, and on the lower side of the mid femora near the apex a row of short spiny bristles on the outer and inner edge. Females with no cerci, the hypopygium on the outside all round set with short spiny bristles, usually the tips curved outward. (Females that presumably have laid eggs, often have lost most of these spines, from which we might gather that they are used for the purpose of pushing the ovipositor into something to leave the egg behind. The local specimens all seem to be taken above or near large dampish cellars.)

Genotype, *A. cineraria* Loew.

Acantholeria oediemus, new species.

Male and female. Foremost fronto-orbital from nothing to about a third of the hind one, in the female averaging larger, very rarely nearly a half. No prosternal bristle; large humeral and (four) dorso-centrals.

Length, 5 to 7 mm., taken *in copula*.

Head pale brown, antennæ to vertex red-yellow, antennæ red-yellow; arista medium long, black and very short microscopically pubescent. Vibrissæ one long strong, below a single row of hairs to lower edge.

Thorax, dorsum pale olive brown, rarely a thin median red-brown stripe; dorso-centrals rising from spots of the same color; dorsum irregularly sparingly hairy.

Pleura color as dorsum, but occasionally with a grayish peppering; propleura one bristle, mesopleura bare, except two to four hairs below the disk. Pteropleura bare, sternopleura one strong bristle and six or seven hairs near the top edge, three or four in the middle, and many bristles between the coxæ.

Abdomen gray-black, the end segments sometimes with reddish yellow, all sparingly hairy; male hypopygium red-yellow (construction distinct from *cineraria* and *abnormalis*).

Legs red-yellow in male, the hind femora on the under and inner side with a cluster of 7 to 12 thick strong longish spines with hooked tips, all rising close together but spreading out in fan-shape; from the roots of these to the base perfectly bare and smoothly polished. On the under but outer side, a straight row of smaller spines, from the base; opposite the roots of the cluster a sudden drop to hairs, medium long but thin to the apex. Hind tibia on the under side with an even swell to a bump near the middle.

Described from 241 specimens, 107 male, 133 female. All from Cranbrook and Michel, British Columbia, April to August.

Acantholeria abnormalis, new species.

Male. Similar to *oediemus* except interior construction of hypopygium and armament of the hind legs, which on the

under and inner side about the middle have two or three short stout spines, the tips straight; from there to the base are irregular hairs, some short, some long, and approaching bristles in size. On the outer edge of under side are only short hairs all along, or a few bristly hairs near the apex. Hind tibia with no even swelling or bump, but an abrupt blunt point sticking up like a tree-stump.

Described from three males, two on 28th July from Michel, British Columbia, about 4,000 feet, and one, 15th August, Gallatin County, Montana, 5,400 feet.

This latter specimen was sent me by Prof. Cooley, and I had marked it *abnormalis* thinking it such. When I took the other two I examined the interior of the hypopygium and found it distinct.

I have returned a Michel male to Prof. Cooley.

The types of all species are in the collection of the author. Paratypes will be deposited as follows: *Postleria fuscolineata*, male and female, to the U. S. National Museum, the Canadian National Collection, and to Dr. J. M. Aldrich; *Amoebaleria gigas* to the same, and also to Dr. Ferris, Leland Stanford Jr. University, Professor Cooley, Bozeman, Mont., and Dr. C. W. Johnson, Boston, Mass.; one female of *Leria aldrichi* to Dr. Aldrich; one female of *Morpholeria melanewra* to the U. S. National Museum and Canadian National Collection; one male of *Acantholeria abnormalis* to Professor Cooley.

SOME NEW MUSCOID GENERA ANCIENT AND RECENT

BY CHARLES H. T. TOWNSEND

The following new genera are proposed at this time in order that they may be included in a forthcoming treatment of the muscoid genera of the world.

AUSTENINA gen. nov.—Proposed for *Glossina brevipalpis* Newstead (1910), Ann. Trop. Med. Paras, IV, 372. Differs from *Newsteadina* by the comparatively short palpi.

AWATIA gen. nov.—Proposed for *Musca indica* Awati

(1916), Ind. Jn. Med. Res. IV, 138. Belongs in the *Philæmatomyia* group, as later pointed out by Awati, but differs from all the other forms of the group in being larviparous. It is immediately distinguished from *Pristirhynchomyia*, to which it is most closely allied, by its well developed presutural dorso-central bristles.

Berendtia gen. nov. *baltica* sp. nov. (fossil).—Proposed for *Oestrus* sp. Berendt (1830), Ins. Bernst., 34. From the Lower Oligocene of Baltic amber. The description indicates affinity with the Oestrine series of tribes.

Giebelia gen. nov. *ignota* sp. nov. (fossil).—Proposed for *Oestrus* sp. Giebel (1846), Palæozool., 278. From the Tertiary, origin unknown. Description indicates affinity with the Oestrine series.

Himantostomopsis gen. nov.—Proposed for *Himantostoma hungarica* Thalhammer (1897), Term. Fuezet. XX, 145. Differs from *Diplopota* Bezzi by the pilose parafacialia and the arcuate course of fourth vein.

Lithexorista gen. nov. *scudderi* sp. nov. (fossil).—Proposed for *Tackina* sp. Scudder (1890), Tert. Ins., 554. From the Eocene of Green River, Wyoming. The characters point to a location somewhere in the Lydelline to Exoristine series of tribes.

Lithotachina gen. nov. (fossil).—Proposed for *Echinomyia antiqua* Heer (1849), Ins Tert. Ceningen II, Nouv. Mem. Soc. Helv. Sc. Nat. XI, 247-8, pl. 17, f. 17. From the Upper Miocene of Oeningen. The characters indicate one of the Larvævorini, perhaps closely allied to the existing genus *Servillia*.

Newsteadina gen. nov.—Proposed for *Stomoxys fuscus* Walker (1849), List Dipt. Ins., III, 682. See Austen (1911), Hdb. Tsetse Flies, 76, f. 17A, for male hypopygial characters; and Evans (1919), Ann. Trop. Med. Paras. XIII, 31-56, for female hypopygial characters. The *fusca* group has long been recognized on male hypopygial characters; it may be recognized in the female by the dorsal plates being present and the mediodorsal plates absent.

Paleostomoxys gen. nov. *giebelii* sp. nov. (fossil).—Pro-

posed for *Stomoxys* sp. Giebel (1846), Palæozool., 278. From the Tertiary, origin unknown. Characters point to possible location in the Stomoxydine to Plaxemyine series.

Paleotachina gen. nov. *smithii* sp. nov. (fossil).—Proposed for *Echinomyia* sp. Smith (1868), Qu. Jn. Sc. V, 183, f. 2. From the Lower Oligocene of Baltic amber. The description indicates one of the Larvævorini or allied tribes.

Palxorista gen. nov. (fossil).—Proposed for *Tichina succini* Giebel (1862), Wirb. Ins. Bernst., Zeits. Ges. Nat. XX, 319. From the Lower Oligocene of Baltic amber. The description rather indicates one of the true tachinids, but the venation is of the sarcophagid type. The form may belong in or near the Miltogrammini.

Suiæstrus cookii gen. et sp. nov. (maggot III only).—Proposed for the material referred to in Insect Life III, 161-2, being a single third-stage maggot of œstrid aspect, labeled "4732, *Cephenemyia* on pigs, S. S. Cook, Parkersburg, W. Va.," now in U. S. N. M. Coll.

Mandibular sclerite of c. ph. skel. double, short, curved, sharply pointed. Anal stigmata showing semicircular closely approximated plates, each with six long slender strongly sinuous slits closely crowded together and an inner submarginal button, being somewhat like those of *Stasissea*. Body segments each with about three or four rows of black spines on anterior half or so, the spines being sharp, flattened, not very broad, twice or more as long as basal width. There are also scattered spines on posterior part of segments from middle of body backward. Both the spines and their arrangement are thus much as in *Cephenemyia*. Form of body elongate and subpyriform, much like *Dermatobia*. Cephalic shield absent.

Villeneuveia gen. nov.—Proposed for *Lissoglossa taeniata* Villeneuve (1913), Bull. Mus. Hist. Nat. 1912, 506-7, pl. X. Differs from *Lissoglossa* by short head, normal front and parafacialia, shortened antennæ, head chaetotaxy, only gently receding facial profile. *Lissoglossa* has the head much elongated, the front very produced, parafacialia very widened above, antennæ long, face very receding.

A NEW SPECIES OF TIPULA INJURIOUS TO PASTURE LANDS

(*Tipulidæ*, *Diptera*)

By CHARLES P. ALEXANDER

The following undescribed species of crane-fly was kindly sent to me for determination by Messrs. Packard and Thompson. The species, together with several additional members of the genus, is recorded as doing material injury to the interior pasture lands of California.

***Tipula graminivora*, new species.**

Small species (male not over 10 mm. in length); males full-winged, females with the wings semi-atrophied; general coloration gray, the mesonotal praescutum with four dark brown stripes; wings of male yellowish subhyaline, clouded with grayish brown; ninth tergite of the male hypopygium with a very broad, V-shaped median notch; tergal valves of ovipositor flattened, terminating in a curved hook.

Male.—Length, 8.5–9.3 mm.; wing, 9–9.5 mm.

Female.—Length, 12.5–14 mm.; wing, 3.1–3.3 mm.

Male. Frontal prolongation of head gray; nasus stout; palpi brown, the basal segment pruinose. Antennæ short, dark brown throughout, the flagellar segments short-cylindrical, feebly constricted near midlength. Head gray; a row of setæ on vertex parallel with inner margin of eye.

Mesonotal praescutum light brown with four dark brown stripes, the intermediate pair separated by a narrow median line of the ground-color, the lateral stripes with paler centers; scutum gray, the lobes darker gray; remainder of mesonotum gray, a capillary, dark brown, median line extending from scutum to base of abdomen; scutellum and postnotum with scattered black setæ. Pleura gray. Halteres brown, the knobs darker. Legs with the coxæ gray; trochanters dark brown; remainder of the legs dark brown, the femoral bases broadly obscure yellow, narrowest on fore legs, broadest on the posterior legs where only the broad tips are infuscated. Wings yellowish subhyaline, handsomely clouded with grayish brown;

stigma grayish brown; small brown clouds at the origin of the sector and along the cord; conspicuous clouds in cell R_3 except the base, cells M_1 and 2nd M_2 , cell M_4 except the base; conspicuous clouds in the center of cells Cu_1 , ends of the anal cells, base and tip of cell Cu and two conspicuous areas in cell M , one near midlength, the second, larger, in the outer end of the cell; a conspicuous obliterative streak before the cord, extending from cell 1st R_1 across the basal third of cell 1st M_2 into the base of cell M_4 ; veins dark brown. Venation: Tip of R_2 about one-half longer than R_2+3 ; cell 1st M_2 elongate, the sides parallel; petiole of cell M_1 a little longer than m ; $m-cu$ at about one-third the length of cell 1st M_2 .

Abdominal tergites brown, the lateral margins broadly and conspicuously buffy gray; sternites similar but sparsely pruinose, the caudal margins of the sternites and the subterminal tergites very narrowly reddish yellow. Male hypopygium simple, the sclerites covered with pale, appressed, silken hairs. Ninth tergite flattened, the caudal margin with a very broad and shallow V-shaped notch, the edges narrowly blackened. Ninth sterno-pleurite projecting slightly caudad, profoundly but narrowly split medially, the cephalic-median area membranaceous; outer pleural appendage small, cylindrical. Eighth sternite practically unarmed, the dorsal caudal margin with a small area of black bristles on either side of the median line.

Female. Generally similar to the male, differing as follows: Antennæ much shorter. Legs shorter and stouter. Wings reduced to pads that extend about to the end of the second abdominal segment; wings infuscated with somewhat paler bases; venation considerably distorted but showing approximately the same arrangement as in male; macrotrichiæ along the costal margin; a dense series of from 55 to 60 along R ; about 9 along R_4+5 ; about 4 on the basal portion of M ; a series of about 9 powerful spinous setæ on the basal section of Cu before the arculus. Abdomen rather elongate, the tergites mostly highly polished, dark chestnut brown, the

caudal margins of the subterminal segments obscure yellow; shield of the ovipositor black, very long, subcylindrical to slightly compressed, carinate dorso-medially. Ovipositor with only the tergal valves functional, these appearing as flattened, chitinized, rectangular blades, the margins smooth, the caudal-proximal angle produced caudad and laterad into a powerful spine.

Habitat.—California.

Holotype, male, Elmira, April 7, 1921 (B. G. Thompson); Sac. No. 2185.

Allotype, female, Galt, March 29, 1921 (B. G. Thompson); Sac. No. 2164.

Paratopotypes, 5 males, April 7 and 12, 1921 (Nos. 2186, 2187, 21103, 21105, and 21106).

Paratypes, 1 male, Dixon, March 31, 1921, No. 2176; 2 males, 3 females, April 12, 1921 (Nos. 21101, 21102, and 21100, 2198, 2199); Franklin, April 1, 1921 (No. 2178); Galt, April 1, 1921 (No. 2177).

Type in the collection of the National Museum.

Tipula graminivora is allied to *T. quaylii* Doane, *T. bituberculata* Doane, *T. caluilla* Alexander and others, especially to *T. quaylii*, but is a remarkably distinct species.

NEW AMERICAN LEPIDOPTERA AND RECORDS

By HARRISON G. DYAR

Family HESPERIDÆ

***Butleria bubobon*, new species.**

Black above with bronzy brown reflection; fore wing with an oblique quadrate yellow spot in the cell, with two diffused spots below, reversely oblique; three small subapical spots approximated, one above vein 3, a larger one above vein 2, more inwardly, with a small dark yellow spot next to it, the other side of the vein. Hind wing with dark yellow spot in the disk and outer row of four, outermost large, second minute, third and fourth separated by vein 2; fringe with pale checkers. Be-

low, spots repeated, enlarged; fore wing with an additional spot at end of cell and terminal row above vein 3. Hind wing with numerous yellow spots and shadings filling in the space between the repeated markings; three rounded spots along costa. Expanse, 36 mm.

Type, male, No. 24094, U. S. Nat. Mus.; Guerrero, Mexico, July, 1920 (R. Müller).

Family SPHINGIDÆ

Perigonia lusca bahamensis Clark.

Perigonia lusca bahamensis Clark, Proc. N. E. Zool. Club, vi, 108, 1919.

This brightly marked form of *lusca* Fab., described from the Bahamas, occurs also in Florida. It seems to us to represent a distinct race, and not a variety of *interrupta* Walk., as Mr. Clark has been inclined to consider it in a later publication.

Paradise Key, Florida, February, 1919 (Schwarz & Barber).

Family LITHOSIIDÆ

Illice bellicula, new species.

Fore wing gray, with a pink spot at outer third of costa and one at tornus, the latter joined to base by a yellowish ray. Hind wing pink, a large gray spot at tip. Head and thorax gray, back of head, collar, patagia and abdomen pink. Expanse, 14 mm.

Types, three males, No. 24343, U. S. Nat. Mus.; Florida (Schaus collection) and Paradise Key, Florida, March 1, 1919 (Schwarz & Barber).

Nearest to *subjecta* Walker, smaller, the pink parts much redder, the wings narrower, the markings narrow and delicate.

Family NOCTUIDÆ

Subfamily HADENINÆ

Perigrapha puncticostata, new species.

Bright red-brown, the markings obliterate, reniform alone distinct, dark-filled, pale reddish outlined; two distinct white flecks on costa, followed by three small ones toward apex;

traces of ordinary lines pale, the outer followed by dark points. Hind wing pale fuscous, the veins and margin stained with reddish; a dark fuscous discal point and crenulate broken terminal line. Expanse, 30-32 mm.

Types, male and female, No. 24341, U. S. Nat. Mus.; San Diego, California, February 11-12, 1920 (K. R. Coolidge).

Subfamily CATOCALINÆ

Nymbis succrassata, new species.

Cellular area of fore wing and whole of hind wing below covered with rough erect scales; legs smoothly scaled. Dark brown, the fore wing gray in basal space, shaded with purplish beyond; inner line oblique, denticulate, preceded by a round blackish spot on inner margin; an irregular medial shade line; stigmata obsolete, a brown shade running out from end of cell; outer line strongly incurved centrally, narrow, pale, with dark outer edge; terminal space blackish, with a row of small black dots remote from the margin. Expanse, 45 mm.

Type, male, No. 24342, U. S. Nat. Mus.; Paramaribo, Surinam (C. J. Herring, letter dated December 2, 1882).

Family NOTODONTIDÆ

Disphragis cubana Grote.

Heterocampa cubana Grote, Proc. Ent. Soc. Phil., v, 252, 1865.

Paradise Key, Florida, March 8, 1919, male (Schwarz & Barber). Hitherto unrecorded from the American mainland.

Disphragis picta Felder.

Packard's *Heterocampa obliqua*, var. *perolivata*, is a synonym of *picta*, as originally given by me (Bull. 52, U. S. Nat. Mus., 254, 1903). Barnes & McDunnough have unjustifiably changed the synonymy in their recent list (Check list Lep. Bor. Am., 94, 1917).

Paradise Key, Florida, March 3, 1919 (Schwarz & Barber).

Disphragis georgiana, new species.

Mistaken by Packard in the female for *obliqua* Pack., and figured by him (Mem. Nat. Acad. Sci., vii, pl. 5, fig. 9, 1895).

The true female of *obliqua* is always brown (*trouvelotii* Pack. = *brunnea* G. & R.). In the present species, the sexes are similar.

Discal mark more lunate and blacker than in *obliqua*; pale shade before the subterminal line less contrasted, greener, more extensive, running down to anal angle and not as much broken into spots; dashes between veins 5 and 7 absorbed in the black subterminal shade; terminal line broken into zigzag dashes, more irregular than in *obliqua*.

Types, No. 24160, U. S. Nat. Mus.; one male and two females, Georgia; one female, Florida, without further data.

The larva differs from that of *obliqua* in having the dorsal whitish band less widely extended on the sides and more broadly joined on joints 7-8; but it does not possess these characters in as marked a degree as the larva of *picta*, being intermediate between the two larvæ.

Larval data: Atlanta, Georgia, September 9, 1878 (C. V. Riley); "249L" (C. V. Riley); "281L," June 2, 1873 (C. V. Riley); "249L?," on oak, September 29, 1874 (C. V. Riley); "on oak," July 26, 1882 (young), August 24, 1882 (mature) (C. V. Riley); Tryon, North Carolina (H. G. Dyar).

This may be *varia* Walker (Cat. Brit. Mus., v, 1023, 1855) described from a single female without locality, provided that specimen was American. In Bulletin 52 I made *varia* a synonym of *astarte*; Packard made it the same as *obliqua*, but did not use the name; Barnes & McDunnough use *varia* with *obliqua* as synonym. I have no data beyond Walker's description, which cannot apply to *obliqua* nor *astarte*, coming nearest to the present form.

Disphragis rufinans, new species.

Fore wing gray, with a reddish blotch on inner margin near base and another replacing the lower part of the subapical white streak; subbasal line black, indicated on costal half; a narrow black streak along submedian from base to the red area; inner and outer line black, geminate, pale filled, the outer especially dislocated on the veins and exerted mesially; a white streak from apex beyond outer line; black terminal

dashes, perpendicular to the veins, above vein 2 serially dislocated; black marginal streaks on veins 7 and 8. Hind wing white, with only a little gray on costa and vein 7. Expanse, 45 mm.

Type, male, No. 24348, U. S. Nat. Mus.; Park County, Colorado, 10,000 feet (D. Bruce).

Disphragis baryspus, new species.

Female. Fore wing gray, the olivaceous greenish areas confined to subapical streak, wedge between veins 2-3 and an area below median and vein 2 between inner and subterminal lines; lines black, double; a reddish area before inner line on inner margin and about the black lunate discal mark; a strong black shade beyond the subapical streak, narrowly bordering the wedge 2-3 and running in below it to median vein; veins outwardly black; terminal line black, crenulate, narrowly duplicated. Hind wing dark gray, with white hairs on inner margin. Expanse, 60 mm.

Nearest to *georgiana* Dyar, but the terminal line is even and not angled and dislocated as in that species.

Type, female, No. 24349, U. S. Nat. Mus.; Tryon, North Carolina (W. F. Fiske).

Two males associated with the female are apparently large specimens of *umbrata* Walker (*pulverea* G. & R.), and apparently unrelated to it.

Disphragis pasathelys, new species.

Fore wing gray, without any white shades; a black basal line on submedian; subbasal, inner and outer lines black, geminate, the outer brownish and weak; a lunate discal mark; a black shade through end of cell between veins 2-3 to subterminal; subterminal line of heavy joined black dashes from apex to vein 4, dislocated outward and again inwardly oblique to vein 1; lower portion of wing within this line somewhat darker and more olivaceous. Hind wing white on the disk, costa and outer margin gray, marked on the veins, and a slight terminal line, looped between the veins as on fore wing; a faint outer grayish line, distinct and followed by pale in the costal gray area. Expanse, 52 mm.

Type, No. 24350, U. S. Nat. Mus.; type, female, southern Arizona (E. J. Osler); paratypes, seven females, four, Jalapa, Mexico (Schaus collection), Orizaba, Mexico, March, 1908 (R. Müller), Zacualpan, Mexico, October, 1917 (R. Müller), Guerrero Mill, Hidalgo, Mexico, 9,000 feet (Mann & Skewes, gift of B. Preston Clark).

Nystalea indiana Grote.

Nystalea indiana Grote, Papilio, iv, 7, 1884.

Nystalea guttulata Schaus, Trans. Am. Ent. Soc., xxx, 143, 1904.

Paradise Key, Florida, March 4, 1919 (Schwarz & Barber).

Nystalea eutalanta, new species.

Near *ebalea* Cramer, smaller, stouter, with a large whitish mark from costa surrounding the discal mark. Shaded with blackish gray; inner line indicated, slightly curved across wing, just beyond origin of vein 2; a rounded black spot below vein 2; outer line indicated, oblique, slender, followed by blackish; terminal space lighter, with a faint wavy dark subterminal line. Hind wing whitish; veins and margin dark fuscous. Expanse, male, 48 mm.; female, 52 mm.

Type, No. 24161, U. S. Nat. Mus.; male, Cocoanut Grove, Florida, March 6 (W. H. Broadwell); female, Paradise Key, Florida, March 1, 1919 (Schwarz & Barber).

Family NOCTUIDÆ

Subfamily PANTHEINÆ

Diphthera angelica, new species.

Fore wing even stone-gray, black scales rather coarsely irrorated over a whitish ground; a black mark on base of costa; three lines grouped toward the center of the wing, inner, median and outer, the median heaviest, in bent mesially, denticulate, whitish without. Hind wing whitish, veins and terminal line gray; discal dot showing by transparency; an outer broad gray shade, touching apex and tornus. Expanse, 40 mm.

Type, male, No. 24719, U. S. Nat. Mus.; Los Angeles, California, Mount Lowe, 4,000 feet, September 9, 1920 (K. R. Coolidge).

Family PYRALIDÆ

Subfamily PYRAUSTINÆ

Pyrausta liopasialis Dyar.

Pyrausta liopasialis Dyar, Proc. U. S. Nat. Mus., xlvii, 284, 1914.

Florida specimens agree with this form, described from Panama, rather than with the smaller and redder *rhodope* Hampson (Ann. Mag. Nat. Hist., (8), xii, 36, 1913) from Cuba.

Paradise Key, Florida, March 1, 3, 4, 10, 1919 (Schwarz & Barber).

Edia coolidgei, new species.

Fore wing with the white ground color confined to a submedian line and discal venules; a broad brown shade across middle and at apex, in which the veins are bordered on both sides with blackish; fringe mixed black and white. Hind wing tinged with light gray. Expanse, 12 mm.

Type, female, No. 24346, U. S. Nat. Mus.; Palm Springs, California, July 21, 1920 (K. R. Coolidge).

Evidently allied to *E. minutissima* Smith, which is not before me.

Subfamily SCHOENOBIIINÆ

Schoenobius uxorialis, new species.

Fore wing short and narrow, the outer margin very oblique, as usual in females of the genus; dark gray, irrorate, the costa narrowly white by reflection; median vein and branches pale; a black discal dot and one on submedian at basal third; small dots at the ends of the veins at base of fringe. Hind wing pale fuscous. Expanse, 18 mm.

Type, male, No. 24347, U. S. Nat. Mus.; Paradise Key, Florida, March 9, 1919 (Schwarz & Barber).

Subfamily PHYCITINÆ

Anegcephalesis catheretes Dyar.

One female, Paradise Key, Florida, March 3, 1919 (Schwarz & Barber).

Subfamily CHRYSAUGINÆ

Artopsis nua Dyar.

Artopsis nua Dyar, Ins. Ins. Mens., ii, 164, 1914.

Two males, Paradise Key, Florida, March 9, 1919 (Schwarz & Barber).

Barnes & McDunnough in their "list" (Check List Lep. Bor. Am., 138, 1917) made this a synonym of *culiculalis* Hulst, which they resurrected from the synonymy for the purpose, and made a variety of *Parachma ochracealis* Walker. That *culiculalis* should be rescued from the synonymy is quite possible, but it cannot be the same as *nua*, for Hulst's description has the hind wings "fuscous ocherous," whereas they are distinctly red in *nua*. Differences in venation may also exist; but Hulst's type is not available to me at this writing. As to *Parachma ochracealis*, I have specimens from Texas agreeing with Hampson's diagnosis (Proc. Zool. Soc. Lond., 659, 1897), certainly generically distinct from *Artopsis nua*.

Xantippe uranides, new species.

Fore wing dark purple-brown, the median space slightly more blackish; lines two, slender, whitish, waved, situated far out, the outer arising from tornus; a series of dark terminal dashes. Hind wing fuscous, lighter toward base. Expanse, 12 mm.

Type, female, No. 24369, U. S. Nat. Mus.; Paradise Key, Florida, February 22, 1919 (Schwarz & Barber).

Xantippe beatifica, new species.

Fore wing purple red, irrorated with ocher nearly half and half; lines yellowish, a little irregular, slightly approaching toward costa. Hind wing rather dark fuscous, somewhat translucent, especially toward base. Expanse, 18 mm.

Type, male, No. 24370, U. S. Nat. Mus.; San Gabriel Mountains, California, 3,000 feet, June 2, 1910 (F. Grinnell, jr.).

Family LIMACODIDÆ

Lithacodes gracea, new species.

Fore wing reddish brown, hind wing dark ocher; a single

rigid slightly oblique line beyond the middle, white, narrow, followed by a narrow purple brown border. Expanse, 19 mm.

Types, four males, No. 24344, U. S. Nat. Mus.; Paradise Key, Florida, March 4 and 9, 1919 (Schwarz & Barber).

The wing-shape of *laticlavata* Clemens, than which this is smaller, the transverse line rigid and narrow, the subapical branch obsolete.

AN UNDESCRIBED WEST AFRICAN SPECIES OF PTYCHOPTERA MEIGEN

(Diptera, Ptychopteridæ)

By CHARLES P. ALEXANDER

In a small collection of crane-flies from the Cameroun sent to me for naming by Dr. Holland and Mr. Kahl of the Carnegie Museum, there was included an undescribed species of *Ptychoptera*. I am indebted to Dr. Holland and Mr. Kahl for the privilege of studying their collections of West African Tipuloidea.

The three known Ethiopian species of *Ptychoptera* may be separated by the following key:

1. Mesonotum orange, unmarked (Natal—Eastern Transvaal),
capensis Alex.¹
Mesonotum blue-black 2
2. Thoracic pleura yellow; wings with the costal margin and apex
dark brown; abdomen black, the third and fourth tergites with
narrow yellow rings (Nigeria).....*africana* Alex.²
Thoracic pleura brownish black with a restricted yellowish white
area ventrad of the anterior spiracle; wings with the costal
margin and apex not conspicuously darkened; abdomen orange,
tergites one to five ringed caudally with brownish black; a
black subterminal ring; hypopygium reddish brown (Cam-
eroun)*camerounensis*, new species

¹ *Ptychoptera capensis* Alex.; Ann. S. Afr. Mus., vol. 17, pp. 139-140; 1917. Type in South African Museum.

² *Ptychoptera africana* Alex.; Entomologist, vol. 53, pp. 101-102; 1920. Type in British Museum.

Ptychoptera camerounensis, new species.

General coloration blue-black; thoracic sternites and ventral pleurites reddish yellow; wings grayish subhyaline, with two narrow brown crossbands; abdomen orange with a subterminal black ring; tergites one to five ringed caudally with brownish black.

Male.—Length, about 8 mm.; wing, 7.4 mm.

Mouthparts reddish testaceous; palpi obscure yellow, the terminal segments brown. Antennal flagellum black, the scapal segments in the unique type injured. Head blue-black.

Thoracic notum blue-black. Dorsal pleurites brownish black, the ventral pleurites and sternites reddish yellow; a narrow yellowish white area on the propleura between the anterior spiracle and the fore coxa. Halteres dark brown, the base of the stem reddish yellow. Legs with the coxæ and trochanters reddish yellow; femora yellowish testaceous, darkened toward the tip; tibiæ and tarsi dark brown. Wings grayish subhyaline, the costal region more brownish yellow; two narrow brown crossbands, the first at the cord, extending to beyond the fork of *Cu*; second crossband at the fork of $R_4 +_5$, becoming indistinct at the fork of *M*; veins dark brown; matrotrichiæ of wing extensive, passing into the distal ends of the basal cells. Venation: *Rs* short, straight, a little shorter than *r-m*.

Abdomen orange, tergites one to five ringed caudally with brownish black; a black subterminal ring; hypopygium reddish brown. Hypopygium with the lateral angles of the ninth tergite digitiform, tapering caudally and ventrally into slender hairy points; pleural appendages generally similar in shape to the tergal lobes, elongate, cylindrical, slightly curved, the tips blackened, at the base on the inner face with a small tooth.

Habitat.—Cameroun.

Holotype, male, Lolodorf, October 31, 1913 (A. I. Good).

Type in the Carnegie Museum, Accession No. 5264.

TWO NEW MOSQUITOES FROM CHINA

(Diptera, Culicidæ)

By HARRISON G. DYAR

Aedes (Finlaya) eucleptes, new species.

Male. Head with sparse whitish scales over vertex and sides, leaving a black patch on each side. Mesonotum blackish, dark brown scaled, with golden scales in five longitudinal lines, the third line on each side bent laterally around the groove. Abdomen black, with basal segmental lateral white rounded patches; venter blackish, with white bands at the bases of the segments. Legs black, the femora white on the basal half below and with white tip, the mid and hind legs narrowly white beneath to tip; tarsi with minute white rings at the bases of the basal joints, on the hind legs forming broad white rings on the first three joints, the last two tarsals wholly black. Wing scales black.

Hypopygium. Side piece long, slender, conical at base and tip, about four times as long as wide, without lobes; clasper long, simple, with long terminal spine. Claspette columnar, from a broad triangular base, minutely setose within, but two of the setæ larger; filament over half as long as the stem, with curved pointed tip. Basal parts normal, moderate.

Female. The markings are more distinct. Head with the black patch on each side well defined, the white lateral scales also divided by a longitudinal black line below; mesonotum with central golden line distinct, second line very narrow, third curving along the lateral groove, broader; lateral line a little irregular. Pleuræ with white patches.

Type, male, paratype, female, No. 24141, U. S. Nat. Mus.; Canton, China (C. W. Howard). The male is numbered "Canton Christian College, Exp. No. 295" and the female "No. 208."

Allied to *eatoni* Edw., *oreophilus* Edw., *japonicus* Theo., *togoi* Theo., and *macfarlanei* Edw., differing from the first two in having white tarsal rings, and from the last three in the unbanded abdomen. *Togoi* further differs in having white

rings on all the tarsal joints, and the thoracic ornamentation more diffused.

***Aëdes (Stegomyia) christianus*, new species.**

Head black scaled, a white triangular patch on the vertex and two small ones on each side. Mesonotum brown scaled, with four large silvery white spots, two in front and one before each wing, the latter somewhat transverse; scutellum silvery. Abdomen black, with narrow basal segmental silvery bands, broadening posteriorly and a very little so at the sides; venter with the segments broadly white at bases. Legs black, the femora white below, the posterior pair with a black sub-apical ring; tarsi broadly white at the bases of all the joints except the fifth, which is narrow. Wing scales black.

Male hypopygium. Side pieces three times as long as wide, conically tapered; clasper very long, with a spoon-shaped tip, the long terminal spine arising from the hollow of the spoon and having a truncate end; a capitate lobe at middle of side piece, hairy only at the bulbous tip; inner membrane running from it to the base, angled, and with many small and one larger seta, essentially as in *gardnerii* Ludlow.

Types, five males and three females, two males and a female in the U. S. National Museum, No. 24142, U. S. Nat. Mus.; two males and a female in the collection of Mr. C. W. Howard, Canton, China; a male and female in the collection of Mr. C. S. Banks, Manila, Philippine Islands; Honam, China, April 3, 1920 (C. W. Howard).

THE MOSQUITOES OF ARGENTINA

(*Diptera, Culicidæ*)

BY HARRISON G. DYAR

Since publishing my note on Argentine mosquitoes (Ins. Ins. Mens., vii, 85, 1919), further material has been examined. The following list indicates the present status. Names preceded by an asterisk have been examined by me from Argentina.

**Sabethes cyaneus* Fabricius.

**Wyeomyia* sp.

**Limatus leontiniæ* Brèthes.

Goeldia paranensis Brèthes.

**Culex* (*Culex*) *pipiens* Linn. (*flavipes* Macquart).

**Culex* (*Culex*) *dolosa* Lynch (*bonariensis* Brèthes).

?*Culex* (*Culex*) *quinquefasciatus* Say.

Culex (*Culex*) *brethesi* Dyar.

Culex (*Chæroporpa*) *intrincatus* Brèthes.

Tæniorhynchus (*Tæniorhynchus*) *titillans* Walker.

Tæniorhynchus (*Coquillettidia*) *fasciolatus* Lynch.

**Psorophora* (*Psorophora*) *tibialis* Rob.-Desv. (*lynchi* Brèthes).

**Psorophora* (*Psorophora*) *holmbergi* Lynch.

Psorophora (*Janthinosoma*) *discrucians* Walker.

**Psorophora* (*Janthinosoma*) *posticatus* Wied. (*oblita* Lynch, *centrale* Brèthes).

**Psorophora* (*Janthinosoma*) *confinnis* Lynch (*apicalis* Theob., *neoapicalis* Theob.).

**Aëdes* (*Ochlerotatus*) *scapularis* Rondani (*confirmatus* Lynch).

**Aëdes* (*Ochlerotatus*) *albifasciatus* Macquart.

**Aëdes* (*Ochlerotatus*) *lynchii* Brèthes.

**Aëdes* (*Stegomyia*) *ægypti* Linn. (*argenteus* Poir).

**Hæmagogus capricornii* Lutz (*spægazzinii* Brèthes).

**Megarhinus lynchii* Dyar & Knab.

Megarhinus hæmorrhoidalis Rob.-Desv.

Uranotænia nataliæ Lynch.

**Uranotænia pulcherrima* Lynch.

Uranotænia geometrica Theobald.

Anopheles annulipalpis Lynch.

Anopheles pictipennis Phil. (*albitarsis* Lynch).

Anopheles pseudopunctipennis Theobald (*argentinus* Brèthes).

Anopheles argyritarsis Rob.-Desv.

Sabethes cyaneus Fabricius.

A single female in the Paris Museum, by the kindness of M. Séguy, Teju Cuare, near San Ignacio, Upper Parana, 1911 (E. R. Wagner).

Limatus leontinae Brèthes.

Two females in the Paris Museum apparently belong here, but the condition is poor. Del Estero, Province de Santiago, 1909 (E. R. Wagner).

Wyeomyia sp.

A single female in the Paris Museum, unfit to describe. Teju Cuare, near San Ignacio, Upper Parana, 1911 (E. R. Wagner).

Culex dolosa Lynch.

The principle of priority operates to restrict *dolosa* to the *Culex* element, Theobald having made this restriction in 1901, previous to the restriction cited by me from the monograph (Ins. Ins. Mens., vii, 87, 1919). My names must therefore be reversed, *dolosa* applying to the *Culex* element of Lynch (= *bonariensis* Brèthes), or Lynch's male, while his female remains an *Aedes* (= *lynchii* Brèthes).

Psorophora confinnis Lynch.

A single female in the Paris Museum. The wing scales are pointed and Theobald's names *apicalis* and *neoapicalis* are obviously synonyms. Chaco de Santa Fé, Las Garzas, 1903 (E. R. Wagner).

Aedes scapularis Rondani.

A single female in the Paris Museum, Gran Chaco, Loma Negra, 1903 (E. R. Wagner).

Haemagogus capricornii Lutz.

Brèthes described *H. spegazzinii* without describing the claws, as these were apparently missing in his specimen. A single specimen in the Paris Museum has toothed claws, and thus Brèthes's species is obviously the same as *capricornii* from Brazil. The exact status of this species must await the discovery of the male. It may be synonymous with *equinus* Theobald. Del Estero, Province de Santiago, 1909 (E. R. Wagner).

Uranotaenia pulcherrima Lynch.

A single female in the Paris Museum is much damaged, but seems to belong here. Del Estero, Chuna Pampa, Province de Santiago, 1909 (E. R. Wagner).

Insecutor Inscitiae Menstruus

A journal of Entomology, edited by Harrison G. Dyar

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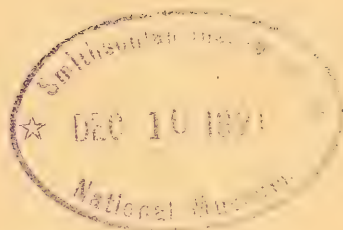
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Insecutor Inscitiae Menstruus

Vol. IX

OCTOBER-DECEMBER, 1921

Nos. 10-12

THE SPECIES OF FINLAYA ALLIED TO TERRENS WALKER

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

The American species of *Aedes*, subgenus *Finlaya*, have the tarsi either wholly dark, regularly banded with white, or irregularly banded. The latter are here noticed.

Both male and female with a dark band through the center of mesonotum.

***Aedes* (Finlaya) podographicus Dyar & Knab.**

Aedes insolita Dyar & Knab (not Coquillett), Journ. N. Y. Ent. Soc., xiv, 203, 1906.

Aedes insolita Dyar (not Coquillett), Proc. Ent. Soc. Wash., viii, 16, 1906.

Verrallina insolita Coquillett (in part), U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 17, 1906.

Aedes podographicus Dyar & Knab, Proc. Biol. Soc. Wash., xix, 165, 1906.

Aedes podographicus Theobald, Mon. Culic., v, 484, 1910.

Aedes podographicus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., ii, pl. 32, fig. 216, 1912.

Aedes podographicus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 812, 1917.

Aedes (*Gualteria*) *podographicus* Dyar, Ins. Ins. Mens., vi, 80, 1918.

Known only from Mexico. The mid tarsi have the black ring very narrow on the second joint. In the male hypopygium the tip of the claspette filament reaches beyond the middle of side-piece.

Aedes (Finlaya) heteropus, new species.

Differs from *podographicus* in having the black ring on the second mid tarsal joint broad, occupying half of the length of the joint. The claspette filament seems somewhat shorter.

Types, eight males and eleven females, No. 24865, U. S. Nat. Mus.; Alajuela, Costa Rica, May and July, 1921, bred from water in bamboo joints (A. Alfaro).

Female with dark band through center of mesonotum, the male silvered across anteriorly.

Aedes (Finlaya) terreus Walker.

Culex terreus Walker, Ins. Saund., 429, 1856.

Stegomyia terreus Theobald, Mon. Culic., i, 305, 1901.

Culex terreus Theobald, Mon. Culic., i, 423, 1901.

Haemagogus oswaldi Lutz, in Bourroul, Mosq. do Brasil, 66, 1904.

Gualteria oswaldi Lutz, Imprensa Medica, Feb. 25, 65, 1905.

Gualteria oswaldi Blanchard, Les Moust., 633, 1905.

Verrallina insolita Coquillett, Can. Ent., xxxviii, 62, 1906.

Verrallina laternaria Coquillett, Proc. Ent. Soc. Wash., vii, 184, 1906.

Aedes laternaria Dyar & Knab, Jn. N. Y. Ent. Soc., xiv, 202, 1906.

Aedes laternaria Dyar, Proc. Ent. Soc. Wash., viii, 17, 1906.

Haemagogus oswaldi Dyar & Knab, Proc. Biol. Soc. Wash., xix, 166, 1906.

Verrallina insolita Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 17, 1906.

Verrallina laternaria Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 17, 1906.

Gualteria oswaldi Theobald, Mon. Culic., iv, 552, 1907.

Gualteria oswaldoi Peryassú, Os. Culic. do Brazil, 45, 64, 177, 1908.

Stegomyia terreus Theobald, Mon. Culic., v, 174, 1910.

Verrallina (?) insolita Theobald, Mon. Culic., v, 496, 1910.

Verrallina (?) laternaria Theobald, Mon. Culic., v, 496, 1910.

Gualteria oswaldi Theobald, Mon. Culic., v, 606, 1910.

Aedes oswaldi Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., ii, pl. 33, fig. 221, 1912.

Aedes oswaldi Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 815, 1917.

Aedes (Gualteria) oswaldi Dyar, Ins. Ins. Mens., vi, 80, 1918.

Aedes terreus Bonne-Wepster & Bonne, Ins. Ins. Mens., ix, 23, 1921.

Dr. and Mrs. Bonne remark that the hypopygium of Walker's type of *terrens* differs from *oswaldi* by the presence in the latter of a long subapical seta on the claspette. This is figured in the monograph (1912) and described by me (1918), but proves to be an artifact, not shown in fresh mounts from the same locality. The above synonymy therefore seems indicated.

The species appears to have a wide distribution, including Brazil, Trinidad, the Guianas, Panama and Mexico. Some uncertainty exists as to the identifications, since both sexes are not always represented from the same locality.

Both sexes with the mesonotum silvered across in front.

***Aedes* (Finlaya) *thorntoni* Dyar & Knab.**

Aedes thorntoni Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 10, 1907.

Aedes insolita Busck (not Coquillett), Smith. Misc. Colls., quart. iss., lii, 64, 1908.

Aedes thorntoni Theobald, Mon. Culic., v, 485, 1910.

Aedes thorntoni Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., ii, pl. 32, fig. 217, 1912.

Aedes thorntoni Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 819, 1917.

Aedes (*Gualteria*) *thorntoni* Dyar, Ins. Ins. Mens., vi, 45, 1918.

The original types contain only females; but the silvering of the mesonotum extends entirely across, which character fixes the species. Specimens are before me from Nicaragua and Panama.

Male with the mesonotum silvered across, the female unknown.

***Aedes* (Finlaya) *argyrothorax* Bonne-Wepster & Bonne.**

Aedes argyrothorax Bonne-Wepster & Bonne, Ins. Ins. Mens., vii, 179, 1920.

The female, unfortunately, has not been made known; but the species cannot be mistaken on account of the peculiarities of the male hypopygium, the claspette filament being expanded and ribbed, unlike the usual filiform type.

NEW MOSQUITOES FROM COSTA RICA

(Diptera, Culicidæ)

BY HARRISON G. DYAR

Culex (Carrollia) metempsyta, new species.

Male hypopygium: Clasper uniform, rather thick, the tip narrower and with a small point above the short thick spine and a seta below this; outer division of lobe of side piece represented by a stout seta close to the insertion of the clasper; inner division of lobe of side piece a long arm, arising from near base of side piece, tapering gradually, with a number of coarse setæ on the shaft; two terminal filaments, one furcate, both bent and with sharp pointed tips.

Male and female: Proboscis, palpi, mesonotum and dorsum of abdomen black-scaled; pleuræ green; sides of abdomen with basal segmental white spots with pearly and violet luster, the spot on the seventh segment detached from base; venter greenish or whitish, the apices of the segments dark; legs black, femora whitish below and at base, mid femora with two, hind femora with one pearly violet spots. Male palpi three-fourths as long as the proboscis, female palpi nearly one-fourth as long as the proboscis.

Types, seven males and eleven females, No. 24863, U. S. Nat. Mus.; Alajuela, Costa Rica, July and August, 1921 (A. Alfaro).

The described species of *Carrollia* may be separated as follows:

1. Tip of clasper nearly simple, with short terminal spine,
metempsyta Dyar
 Tip of clasper distorted and lobed..... 2
 Tip of clasper subspherical..... 3
2. Outer arm of lobe of side piece a rod with apical spines,
bonnei Dyar
 Outer arm reduced to a spine.....*secunda* Bonne-Wepster & Bonne
3. Inner arm of side piece preceded by a patch of setæ,
infoliata Bonne-Wepster & Bonne
 Inner arm of side piece followed by a row of foliate scales,
urichii Coquillett

Culex (Carrollia) bonnei, new name.

Dr. and Mrs. Bonne identified the species of *Carrollia* found by them in Surinam as *iridescens* Lutz. The *Carrollia* forms appear to be very local, as witness the marked differences between *secunda* from Panama and *metempsyta* from Costa Rica. Hence this identification of *iridescens* Lutz of Brazil appears to be doubtful, and I propose to fix the Surinam form with the name *bonnei*. The male genital structures of the true *iridescens* have not been described.

A male and two females are before me, to which I have attached the U. S. Nat. Mus. type No. 24862.

Haemagogus anastasionis, new species.

Male hypopygium: Side piece three times as long as wide, the tip conical; a hairy lobe at inner base; many scales on inner margin; clasper moderate, the terminal spine nearly half its length; claspette straight, rather stout and of moderate length, densely hirsute inwardly and with a seta at outer third; terminal filament short, sickle-shaped, ribbed.

Male and female: With blue and green luster; margins of prothoracic lobes, pleuræ and sides of abdomen silvered; dorsal silver spots, most distinct on sixth and seventh segments; posterior segments black ventrally and projecting; legs black with blue reflection, the vestiture a little shaggy; femora silvery below at base.

Types, two males and six females, No. 24864, U. S. Nat. Mus.; Puntarenas, Costa Rica, July 15, 1921 (A. Alfaro).

**NOTE ON MELANOCONION INDECORABILIS
THEOBALD**

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

Theobald (1903) described *Melanoconion indecorabilis* from Para, Brazil, from three females and one male. The latter he was not sure belonged to the same species, and he could not separate it from the male of his *M. humilis*. The females

therefore remain as the types. Peryassú (1908) describes the male, but briefly and without reference to the genitalic structures. Dyar (1918) was therefore unable to place the species.

In going over the collection I made the fortunate discovery of a male from São Paulo, Brazil, sent by Dr. Lutz. The localities are somewhat remote; but it is possible that the species ranges throughout tropical Brazil, and as Dr. Lutz is known as a careful student and Theobald's female types are indefinite, I propose to consider this as the male of *indecorabilis* as identified by Dr. Lutz.

Theobald (1910) records the species from Georgia, on the strength of a specimen received from Dr. Ludlow; but this identification is wholly improbable.

Culex (Choeroporpa) indecorabilis Theobald.

Melanoconion indecorabilis Theobald, Mon. Culic., iii, 241, 1903.

Melanoconion indecorabilis Theobald, Mon. Culic., v, 457, 1910.

Neomelanoconion indecorabile Peryassú, Os Culic. do Brazil, 246, 1908.

Melanoconion indecorabile Surcouf & Gonzales-Rincones, Essai Dipt. Vul. Venez., 209, 1911.

Melanoconion indecorabilis Dyar, Ins. Ins. Mens., vi, 110, 1918.

The genitalic structure is distinct from any of the species noticed by me (Ins. Ins. Mens., viii, 54-81, 1920). The structure which I called the third point of the mesosomal plate forms a distinct hook, but wholly separated from the plate itself, arising from the base. The mesosomal plate remains as a ligulate rod with pointed tip, without any emargination at apex.

Side pieces moderately swollen, the tip slender and curved. Inner division of lobe of side piece with two filaments with expanded hooked tips, the shaft rather long, one filament inserted at the tip, the other half way on the shaft. Outer division of lobe of side piece nearly evenly furcate, the limbs well separated; a stout but short seta on the shaft; inner limb with a long filament with hooked tip, and a short filament; outer limb with a bunch of filaments, which may be four or

five, closely crowded, the ones toward the fork longer; no leaf. Tenth sternites comb-shaped with about ten teeth, the tip squarely ended; mesosome as described; basal hooks well recurved and long, but the tips not much curved; articulated plates (basal plates) broad and shallowly emarginate; no ninth tergites visible; eighth segment emarginate ventrally.

TWO UNDESCRIBED TIPULOIDEAN FLIES FROM NEW ZEALAND

(*Diptera, Tanyderidæ* and *Rhyphidæ*)

BY CHARLES P. ALEXANDER

Family TANYDERIDÆ

In 1920 the writer erected the subfamily Bruchomyiinae for the new genus and species, *Bruchomyia argentina*, from the Sierra of Argentina. Later, Edwards¹ described a new species of the group from amber. In the same paper Edwards indicated that the insufficiently known genus *Nemopalpus* Macquart (*Palaeosycorax* Meunier) was a member of this subfamily, which includes, besides the genotype, *N. flavus* Macquart (Canary Islands), the fossil species *N. tertiaria* (Meunier) and *N. molophilinus* (Edwards). Mr. Edwards believed that the group was more properly referable to the family Psychodidae and proposed the subfamily Nemopalpinae to receive the species of *Nemopalpus* and *Bruchomyia*. The writer can see no just reason for rejecting the subfamily name Bruchomyiinae, based on the genus *Bruchomyia*, in favor of the earlier described *Nemopalpus*. The name Bruchomyiinae was the first higher group to be proposed for these flies and if any rules of priority apply to groups of animals higher than the genus, this name should be retained. It is on this same basis that the family Tanyderidae is used, the genus *Tanyderus* being the third to be proposed. If the earlier names are used the family will become the Macrochilidae or

¹ Edwards, F. W. A note on the subfamily Bruchomyiinae (Diptera Nematocera), Ann. Mag. Nat. Hist., ser. 9, vol. 7, p. 437, 1921.

the Protoplasidæ, depending on whether or not the name *Macrochile* is preoccupied. There has been considerable argument during the past year as to the basis for family and subfamily names in entomology and several workers have maintained that the law of priority should refer to higher groups, that is, the first family names proposed should be preserved. In this connection a note by Dr. Aurivillius should be consulted.²

As to whether or not the subfamily Bruchomyiinae is to be referred to the Psychodidæ as is believed by Edwards, Tonnoir and other authorities on the Nematocerous Diptera, to the Tanyderidæ as is now believed by the writer, or to represent a distinct family of flies ancestral to both the Psychodidæ and Tanyderidæ, is a question that future studies must settle. Until more evidence is submitted, the writer is inclined to follow his first assignment of *Bruchomyia* to the family Tanyderidæ.

Among some very interesting microscope slides of Diptera sent the writer by Dr. J. W. Campbell, there was included a slide of the wing of an undescribed member of this palaeogenic group. Although only the wing is available, it is thought best to call attention to this fly at this time.

Nemopalpus zelandiae, new species

Sex ?.—Wing 5.8 mm.

Wings with a slight brownish suffusion, the bases of cells *R* and *M* much paler; a crossband before the cord and cells *M*₃ and *M*₄ are slightly darker than the cells in the apical half of the wing; veins brown. Venation: *Sc* ending opposite *r-m*; both *Sc*₁ and *Sc*₂ present and subequal in length; *Rs* originating far basad; cell *R*₂ about as long as its petiole; *M* incrassated before its fork; petiole of cell *M*₃ short, about twice *m-cu*, the latter faintly indicated, situated at the fork of *M*₃ and *M*₄; *Cu* and 1st *A* distinct. Several veins of the wing are enlarged and all are provided with abundant setigerous punctures.

² Aurivillius, Chr. Descriptions of some South African Heterocera (Lepidoptera), Ann. South African Museum, vol. 18, part 2, art. 4, p. 241, 1921, footnote.

Habitat.—New Zealand (South Island).

Holotype, a wing in balsam, Little River, Canterbury, January 12, 1921 (Gourley).

This wing is preserved in the writer's collection through the kindness of Dr. Campbell and Mr. Gourley. The location of the remainder of the type-specimen is not known to me at this time but may possibly be in the collection of Dr. Tillyard at the Cawthron Institute.

The details of the wing venation lead me to refer this fly to *Nemopalpus* rather than to *Bruchomyia*. Compared with *N. molophilinus*, the present species is notable by its large size, the long Sc , Sc_1 ending opposite $r-m$, and the sessile cell M_1 , the $r-m$ crossvein connecting with M_1+2 exactly at the fork. More material may demonstrate that the generic reference is incorrect.

Family RHYPHIDÆ

Trichocera maori, new species.

Size small (wing of male under 4 mm.); general coloration brown, the mesonotal praescutum ochraceous with a brown median line; head gray; legs dark brown; male hypopygium with the gonapophyses densely set with small chitinized spines; penis-guard with the tips appearing as divergent horns.

Male.—Length 3.2 mm.; wing 3.6 mm.

Female.—Length 3.6 mm.; wing 4.7 mm.

Rostrum and palpi brown. Antennæ with the scapal segments obscure yellow; flagellum dark brown. Head gray.

Pronotum dark brown. Mesonotal praescutum ochraceous with a conspicuous dark brown median stripe; lateral stripes feebly indicated; remainder of mesonotum pale brown. Pleura darker brown. Halteres pale, the knobs dark brown. Legs dark brown. Wings pale grayish subhyaline, unmarked except for a pale brown oval spot at the end of vein R_1 ; veins dark brown. Venation: Sc_1 ending opposite r ; Sc_2 beyond the origin of Rs , the distance about one-half longer than R_2+3 ; R_2+3 a little shorter than the basal section of R_2 ; $m-cu$ very long, only a little shorter than r .

Abdomen brown. Male hypopygium with the pleurites short, the single pleural appendage elongate, the proximal face provided with abundant short setæ. Gonapophyses appearing as conspicuous cushion-shaped structures densely set with small, slightly curved spines, the whole structure suggesting a mace. Penis-guard projecting caudad of the level of the apophyses, each side terminating in a long, laterally directed, divergent horn. In *T. antipodum* Mik, the only described antipodal *Trichocera*, the gonapophyses are armed only with four conspicuous spines and the penis-guard is short, broad-based, tapering to a slender median point. Ovipositor more elongate than in *T. antipodum*.

Habitat.—New Zealand (South Island) .

Holotype, male, Riccarton Bush, 1921 (Gourley) ; in alcohol.

Allotype, female, Otira, altitude 1,260 feet, January 10, 1920 (J. W. Campbell).

Paratopotypes, 3 males, in alcohol.

Type in the writer's collection.

A NOTE ON THE OCCURRENCE OF TWO PYRALIDS

(*Lepidoptera*, *Pyralidæ*)

By G. P. ENGLEHARDT

Pyrausta flavidalis Guenée.

The larva occurs as a root-borer in Ironweed (*Vernonia*). The pupa is formed generally within a silk-lined tube in the broken-off stalks of the previous year's growth. Pupæ occur in late June and July. Imago, July and August.

Newtown, Long Island, New York. Also Clearfield, Pa., collected by Miss Nell McMurray.

Phlyctaenia tertialis Guenée.

Bred from dead and dry shoots of Elderberry (*Sambucus*). The larva hibernates within a flat cocoon inside of the hollow stem. Pupa and adult in April and May.

Brooklyn Botanic Garden, Brooklyn, N. Y.

NEW SPECIES OF HETEROCERA FROM
SOUTH AMERICA

By W. SCHAUS

The following descriptions are mostly of species recently received. Where not otherwise stated the specimens were given to me by my friend, Mr. Julius Arp, of Rio de Janeiro.

Family AMATIDÆ

Correbidia joinvillea, new species.

Male.—Palpi black, the first and second joints streaked below with orange buff. Frons black, vertex and collar orange buff with a medial black line. Thorax black; patagia orange buff. Abdomen black, shaded with brown dorsally on basal segments and with some yellow buff lateral hairs at base. Fore wings orange buff; a large terminal black spot from cell thickly irrorated with steel blue; interspaces between veins 4 and 6 without irrorations except on veins; veins 1, 2, 3, orange buff with black streaks on interspaces; some black dusting antemedially in cell, and below it, and a large black streak on inner margin. Hind wings thinly scaled, smoky, darkest on inner and outer margins; costa straw yellow, not reaching apex. Fore wings below paler, the markings reduced. Hind wings below tinged with yellow, the marginal shading reduced; costa fuscous with basal and postmedial yellow spots.

Expanse 31 mm.

Habitat.—Joinville, South East Brazil.

Type.—Cat. No. 24901, U. S. Nat. Mus.

Near *C. elegans* Druce, the apical patch larger, the apex more produced; the hind wing is entirely smoky.

Ctenucha pohli, new species.

Male.—Palpi black, second joint below yellow buff; first joint below and throat orange. Head and thorax black; collar and patagia gray black all with a medial white line. Abdomen blue black, dorsally shaded with dull fuscous brown cut by faint blue segmental lines; anus orange; venter white, legs black streaked with white. Fore wings black, veins duller on

basal half; the submedian fold and vein finely whitish, but not reaching termen; a white ovate spot beyond cell from veins 4-7, its outer edge slightly indentate on veins 5 and 6. Hind wings black shot with dark blue; cilia white. Fore wings below black; the white spot as above; a white streak below cell at base. Hind wings below black shot with blue; a white line through cell from base to beyond discocellular; a faint white line on submedian fold; the inner margin broadly paler tinged.

Expanse 39 mm.

Habitat.—Rio Doce, Province Minas, Brazil.

Type.—Cat. No. 24902, U. S. Nat. Mus.

Fore wings above like *C. mortia* Schaus; differs below in the white streaks on both wings.

Received from Mr. Bruno Pohl.

***Hyaleucerea grandis*, new species.**

Male.—Head, collar, thorax below and anus mars yellow. Thorax above, legs and tips of palpi black. Abdomen black, shot with dark blue. Fore wings fuscous brown, the veins darker; a broad space below costa to near termen shot with dark blue. Hind wings hyaline, the veins black; margins very broadly blue black. Wings underneath shot with blue green.

Expanse 62 mm.

Habitat.—Ecuador.

Type.—Cat. No. 24903, U. S. Nat. Mus.

Quite unlike any other species.

Family LITHOSIIDÆ

***Progonia venata*, new species.**

Male.—Palpi yellow. Frons dark gray, vertex and collar deep yellow, the latter shaded with gray. Thorax dark gray. Abdomen above black brown the anal segment brownish gray; underneath yellow. Legs fuscous, coxæ with yellow spots. Fore wings above benzo brown, the costal margin orange yellow, the veins finely yellowish. Hind wings black, the cilia grayish. Fore wings below fuscous; costal margin orange

yellow; inner margin yellowish; veins terminally finely yellowish. Hind wings below black; base of costa and terminal line yellowish.

Expanse 25 mm.

Habitat.—Trinidad, Paraguay.

Type.—Cat. No. 23904, U. S. Nat. Mus.

Received from Mr. Pedro Jorgensen.

Family ARCTIIDÆ

Idalus panamensis, new species.

Male.—Palpi dark brown above, a lateral white line, and drab fringe below. Head and collar light drab; some white on frons. Thorax and patagia cinnamon drab; some orange hairs on patagia in front and outwardly. Abdomen above ochreous orange; anus and venter white. Fore wings with basal area cinnamon drab; costal and inner margins irregularly whitish; gray and orange hairs at base; an antemedial white point; pale luteous hairs at base of inner margin and some black scaling medially; a fine dark line from cell between veins 2 and 3 to postmedial shading; a similar line below vein 2 from cell to near termen, also a line above submedian vein, and one below submedian, the latter shorter and medial; the veins on basal area slightly darker than ground color; a transverse straight black line just beyond discocellular; a large whitish semihyaline space beyond cell to postmedial shade this space extends from subcostal and base of vein 7 to vein 3, its lower edge irregular, its outer portion with diffuse drab postmedial shadings and streak projecting inwardly, the shading outwardly lunular, with a dark spot in each lunule on the otherwise light drab terminal space; the veins on outer area finely dark brown; faint darker vertical streaks on interspaces terminally. Hind wings white; inner margin pale yellow; veins 2, 3 and 5 drab; tips of veins darker; cilia tipped with fuscous gray. Wings below white; fore wings with a black crescent on discocellular, the latter white, also three subapical black spots, the largest between veins 5 and 6.

Expanse 35 mm.

Habitat.—Rio Trinidad, Panama.

Type.—Cat. No. 24905, U. S. Nat. Mus.

Collected by Mr. A. Busck.

***Idalus tumara*, new species.**

Female.—Palpi gray with a lateral black streak, and fringed below with white, also with begonia rose at base. Head white. Collar white with rose irrorations behind. Thorax white, the patagia mottled with rose and with an orange yellow spot. Abdomen above begonia rose, the last two segments white; dorsal white spots and a few segmental lines; underneath white; legs mostly white; fore tibiae gray; fore coxae and lines below shoulders rose color. Fore wings maize yellow; costal margin white, not reaching apex; inner margin narrowly white; cilia white; two short black streaks at base of costa; two black streaks in basal half of cell; a shorter streak below cell, and obliquely placed points above and below submedian; some rose color at base below cell, expanding on inner margin. A postmedial transverse black fascia, cut by whitish gray veins, the fascia in bent from costa to median and vein 5, then vertical to inner margin and of uniform width; vein 11 is white and there is a white line on interspaces below costal vein; below cell the fascia is edged with white; a subterminal black spot above vein 5. Hind wings white. Wings underneath white, the fore wings showing the black fascia in transparency, also the subterminal spot.

Expanse 34 mm.

Habitat.—Rio Potaro, British Guiana.

Type.—Cat. No. 24906, U. S. Nat. Mus.

Near *I. agrica* Dyar.

Received from Mr. S. E. Cassino.

***Prumala suanoides*, new species.**

Female.—Body above mustard yellow, the vertex, collar and dorsal tufts on abdomen darker shaded; underneath yellowish white. Fore wings mustard yellow; costal edge faintly tinged with lilacine; indistinct grayish postmedial points above and

below veins 5 and 2; a very small grayish spot at tornus. Hind wings thinly scaled, white faintly tinged with yellow.

Expanse 40 mm.

Habitat.—El Sitio, Costa Rica.

Type.—Cat. No. 24907, U. S. Nat. Mus.

Near *P. suana* Druce and *P. indistincta* Rothschild, the markings still more reduced than in the latter species.

Collected by Barnes and Schaus.

***Zatrephes novicia*, new species.**

Female.—Palpi crimson above, white below. Head, collar, and thorax ochraceous buff thickly irrorated with crimson; abdomen cream color with dorsal crimson mottling at base. Fore wings cinnamon irrorated with crimson; a postmedial flesh colored point above vein 6, and a similar small crescent below vein 5. Hind wings cream color, the termen slightly tinged with crimson. Wings below cream color, the apex and termen of fore wing faintly darker tinged.

Expanse 35 mm.

Habitat.—St. Jean, Maroni River, French Guiana.

Type.—Cat. No. 24908, U. S. Nat. Mus.

Near *Z. dithyris* Hampson, distinguished by its more uniform fore wing and pale hind wing.

Collected by Barnes and Schaus.

***Zatrephes ignota*, new species.**

Male.—Palpi brown above, white below. Head and collar white. Thorax and abdomen above cream color, underneath white. Fore wings cream color, with grayish striæ on terminal portion except on apical space; traces of an inbent fine brownish antemedial line; traces of a medial line formed by striæ at end of cell, on submedian and a line below it; a dark brown, fine, postmedial line oblique on costa, curved between veins 6 and 7, then inbent and lunular to vein 3 forming the inner edge to a series of hyaline spots from veins 6 to 3, the longest spot between veins 4 and 5, all with their outer edges incurved; a short oblong spot above vein 6, and a smaller oval spot above vein 7; cilia from vein 5 to apex mottled with dark

brown. Hind wings maize yellow. Wings below cream color with faint striæ terminally on fore wing.

Expanse 30 mm.

Habitat.—Unknown, probably from the Amazons.

Type.—Cat. No. 24909, U. S. Nat. Mus.

Near *Z. flavida* Hampson.

***Amaxia corata*, new species.**

Male.—Palpi, head, collar and thorax vinaceous fawn; palpi beneath white. Abdomen above scarlet. Body below white; legs white; fore coxæ tipped with dark brown. Fore wings with the basal area from before middle of costa to vein 2 at termen vinaceous fawn, crossed by darker broad striæ; a line of small black spots subbasally from below cell to inner margin; cilia at base of inner margin roseate; the outer edge of basal space crosses the wing obliquely beyond cell, is vertical from vein 5 to vein 3, then down curved to vein 2; apical portion of wing semihyaline white, the veins with numerous dark points; the costal margin white; near apex the white extends below costa, and is edged behind by a vinaceous fawn line, down curved from subcostal to vein 7 where it is toothed towards termen, incurved and outbent to termen just below apex. Hind wings pale rose color the costal margin white; a large glandular spot in cell. Fore wings below with only basal area opaque; costa white to a brown streak at apex; inner margin broadly gray white; a brown line in cell, expanding to a transverse brown spot at end; a roseate space below cell with round fovea; edging of basal area pale salmon pink. Hind wings below pale roseate, the costal margin broadly white.

Expanse 30 mm.

Habitat.—Joinville, South East Brazil.

Type.—Cat. No. 24910, U. S. Nat. Mus.

The hind wing has veins 3 and 5 coincident, 4 absent, 6 and 7 on short stalk, 8 from near end of cell.

***Araeomolis canalis*, new species.**

Male.—Palpi, head and collar white, the different parts

spotted with light cinnamon drab. Thorax brown; patagia light cinnamon drab edged with white. Abdomen yellow, the last four segments black; some dark gray tufts at base; underneath white. Legs white; fore coxæ and streaks on fore tibiæ light cinnamon drab. Fore wings cinnamon drab; costal, a streak below it, subcostal, median, discocellular, submedian and veins 2, 3, 4, white; tips of veins 5, 6, 7, 11, white; a white line along inner margin; a subbasal curved white line; an inbent thick white antemedial line expanding below cell with a projecting line on fold; a white spot medially in cell; a postmedial line of white points, curved below costa and inbent to middle of inner margin. Hind wings thinly scaled light cinnamon drab. Fore wings below with white postmedial punctiform line, and the veins terminally white.

Expanse 32 mm.

Habitat.—Canal Zone, Panama.

Type.—Cat. No. 24911, U. S. Nat. Mus.

Veins 3 and 5, and 6 and 7 on hind wing well stalked.

The fore wing looks superficially like *Automolis pulverosa* Schaus.

***Automolis pretiosa*, new species.**

Female.—Palpi and head brown black. Frons metallic blue. Collar and thorax apricot orange; a dorsal black line from vertex to abdomen. Abdomen black with dorsal and lateral blue spots; some sublateral white points on abdomen underneath near base. Legs fuscous brown. Fore wings apricot orange; costal margin to beyond middle blue black with a fine white line on costa, one below, and one on subcostal; apex and outer margin broadly blue black, narrowing on inner margin and not reaching base; an oblique blue black stripe from costa beyond middle to outer margin, following vein 4, the orange space beyond well rounded above, almost straight below, leaving the costa very narrowly black. Hind wings blue black; costa and cell with an orange yellow spot from base to just beyond middle of wing. Underneath similar.

Expanse 43 mm.

Habitat.—Joinville, South East Brazil.

Type.—Cat. No. 24912, U. S. Nat. Mus.

This species is closely allied to *A. chrysomelas* Walker, and differs in the darker coloring and broader black margins.

***Automolis iheringi*, new species.**

Male.—Head and palpi black, the frons and vertex shaded with dark metallic blue; lateral orange yellow lines beyond antennae; collar and thorax black; orange yellow stripes across collar and patagia, leaving only edges of latter black. Abdomen black dorsally shaded with fuscous blue; brighter blue scales on anus; large orange yellow paired spots ventrally on three basal segments; legs black, the coxæ metallic blue. Fore wings dark purplish brown, the costal margin black; an orange yellow stripe from inner margin near base to close to termen just above vein 6, dully pointed at its extremity, the veins on dark portion of wings grayish. Hind wings black, the costal margin broadly yellow. Fore wings below black, the stripe as above, paler. Hind wings below black with a broad yellow fascia below costa which remains black.

Expanse 39 mm.

Habitat.—São Paulo, South East Brazil.

Type.—Cat. No. 24913, U. S. Nat. Mus.

Distinguished by the black costal margin of fore wings above and the black costal margin of hind wings underneath.

Received from Mr. H. von Ihering.

***Automolis temperata*, new species.**

Male.—Palpi fuscous with a white streak underneath and a small white spot above. Body above primuline yellow; lower part of frons dark metallic blue; a blue black dorsal line from vertex to anus, widest on tegulæ and terminal half of abdomen; a black line from head across shoulders and outer part of patagia. Abdomen below paler with a lateral black line. Thorax below black, at sides yellow; legs black streaked with white; fore coxæ yellow. Fore wings primuline yellow; a black fascia from base below costa to apex above vein 8; the basal third of subcostal cream color; some blue black scales at base; inner margin black from one third from base to termen

close above vein 3, this black space narrowing at each end. Hind wings with the costal half primuline yellow, the anal half black. Wings below similar.

Expanse 38 mm.

Habitat.—Orizaba, Mexico.

Type.—Cat. No. 24914, U. S. Nat. Mus.

Near *A. taeniata* Guerin with the yellow predominating instead of the black.

Collector Schaus.

***Amastus opharina*, new species.**

Female.—Palpi and frons fuscous brown; vertex gray brown. Collar and patagia wood brown; small round black spots on tegulæ; a fine black line on patagia; thorax orange yellow with a broad black medial line. Abdomen above paler yellow with fine black segmental lines; a broad fuscous dorsal shade narrowing at base and terminally; underneath white; a broad black ventral stripe except on last two segments; a broad lateral dark gray stripe edged below by a fine black line. Legs inwardly gray brown, outwardly whitish, tarsi gray brown. Fore wings thinly scaled in disc, light brownish gray shading to wood brown terminally and crossed by fine brownish striæ; a wood brown shade at base mixed with black; a quadrate wood brown patch at end of cell and beyond from vein 4 to costa outwardly edged by a finely wavy black line from vein 5 to costa; costal margin from basal shade to quadrate patch with three light brownish gray spots and two wood brown spots; inner margin broadly dark brown narrowing to tornus; an irregular row of small subterminal semihyaline gray spots, very indistinct. Hind wings semihyaline grayish white, the margins broadly shaded with grayish brown; discocellular darker shaded. Wings below pale grayish with brown irrorations; a vague and large fuscous shade at end of cell on fore wing.

Expanse 65 mm.

Habitat.—Nova Friburgo, Brazil.

Type.—Cat. No. 24915, U. S. Nat. Mus.

Halisidota costistrigata, new species.

Male.—Palpi scarlet with black spots at base of second and third joints. Head, collar, and throat scarlet; patagia black with a central white line extending over shoulders. Abdomen black; a dorsal scarlet tuft at base; last three segments pale scarlet the first crossed by a black line; a lateral white line. Legs black with broad scarlet bands; tarsi scarlet with black rings. Wings black faintly tinged with blue; cilia tipped with white; fore wings with a short white line below costal vein at base. Wings underneath duller, without the white costal line.

Expanse 36 mm.

Habitat.—Caldas, Province Minas, Brazil.

Type.—Cat. No. 24916, U. S. Nat. Mus.

Veins 6 and 7 on hind wings stalked.

Very much like *H. dukinfieldia* Schaus which has no white streak at base of costa and also has veins 6 and 7 on hind wing from upper angle of cell.

Ecpantheria jaguarina, new species.

Male.—Palpi blue black, fringed with white below. Frons fuscous blue, vertex white. Collar white with large gray spots edged with black. Thorax white with paired black-blue lines in front, and similar spots posteriorly, also a medial dorsal spot; patagia whitish gray suffused with fuscous in front, outlined with blue black and with long white fringe. Abdomen above blue black, underneath white with black transverse line at base and terminally; a broad dark orange lateral line edged below with blue black. Fore wings white, the spots where not otherwise stated gray edged with black; a subbasal quadrate spot on costa, and an obliquely ovate spot below cell; an antemedial spot on costa oblique and outangled, its edging inangled suffusing with a very oblique outbent line in cell which in turn connects with the uppermost of three antemedial spots inbent to inner margin; a medial triangular spot on costa, its apex entirely blue black in end of cell above a thick black horizontal streak; four medial quadrate spots from below streak inbent to inner margin; discocellular in-

curved cream color, followed by a black lunule; short black streaks at cell above and below vein 4 suffusing with the thick cellular streak; a postmedial outcurved row of spots, the costal spot largest and suffusing with the spot above vein 6; the spots between veins 6 and 4 smaller; a subterminal series of spots, those above and below vein 8 suffusing and entirely black, the spot below vein 7 small, round, black; a black streak below vein 6; a small triangular spot below vein 5, the spots below this increasing in size to inner margin, those above and below submedian entirely black; a marginal row of small round spots on interspaces those from vein 5 to apex irregular in shape. Hind wings white; a streak of black hairs before inner margin; a small black spot in cell, and one on angle of discocellular; a postmedial small black spot above vein 7; medial and postmedial black spots on costa. Fore wings below almost the same as above; the cellular streak suffusing with antemedial spots. Hind wings below white; the medial costal spot suffusing with spot in cell; a black spot at anal angle also present above.

Expanse 65 mm.

Habitat.—Joinville, South East Brazil.

Type.—Cat. No. 24917, U. S. Nat. Mus.

The horizontal streak across the discocellular is a marked character of this species.

***Ecpantheria flavopunctata*, new species.**

Female.—Head and thorax fuscous; some brown hairs on frons, and luteous hairs on vertex; tegulæ dorsally edged with luteous and crossed by an oblique luteous line from head; some fine luteous streaks on thorax and a wavy line on patagia. Abdomen above blue black, a dorsal and a lateral series of small orange spots; underneath dull black and with small yellow ventral paired spots, not reaching last segments. Fore wings fuscous crossed by series of black spots very finely edged with yellowish scales; basal, antemedial, medial, postmedial and subterminal series; small terminal spots, except the spot between veins 6 and 7 which is larger. Hind wings fuscous;

oblique yellow spots on costa, and a fine line at apex. Fore wings below paler, the spots visible in transparency. Hind wings below fuscous; a horizontal streak at base on costa, a medial spot, an oblique postmedial line and a fine apical line, all orange yellow.

Expanse 52 mm.

Habitat.—Trinidad, Paraguay.

Type.—Cat. No. 24918, U. S. Nat. Mus.

Allied to *E. indecisa* Walker. The yellow costal spots of hind wing are very conspicuous.

Received from Mr. Pedro Jorgensen.

***Tessellota jorgenseni*, new species.**

Female.—Palpi orange with a small brown spot above. Frons dark brown; vertex, collar, and thorax white; some orange shading behind vertex. Abdomen above orange yellow, the anal segment white; dorsal and lateral row of black spots. Body below white; throat and fore coxæ orange yellow; fore tibiæ gray; mid tibiæ with gray spots. Fore wings white, the lines buffy brown; two converging lines at base on costal margin, diverging below cell; antemedial geminate lines forming small quadrate spots between veins; a geminate oblique line medially across costa and cell suffusing below with a large buffy brown space, which is rather narrow from costa to vein 5, and then expands to tornus and inner margin to near base, its edges rather irregular; an irregular geminate postmedial line from costa to vein 3 filled in with yellow buff; a lunular subterminal line and a similar terminal line extending on cilia. Hind wings white, buff brown points on discocellular, and a similar large spot on termen near anal angle. Wings below similar, but duller.

Expanse 31 mm.

Habitat.—Trinidad, Paraguay.

Type.—Cat. No. 24919, U. S. Nat. Mus.

Closely allied to *T. sertata* Berg.

I take pleasure in naming this species after my friend, Mr. Pedro Jorgensen.

Family SATURNIIDÆ

Periga oculata, new species.

Male.—Body above pale orange yellow, the collar and front of thorax slightly darker. Fore wings pale orange yellow; a fine brown antemedial line, outcurved and dentate across cell, incurved below cell, outbent on vein 1, then vertical to inner margin. A large gray spot at end of cell, circled by a black line and containing some black scales; a fine whitish line, faintly lunular, and with some fuscous gray shading from apex to inner margin at two thirds from base, being outwardly shaded with orange from vein 5, this shade expanding to inner margin; a subterminal series of fuscous lunules on interspaces. Hind wings pale orange yellow; a streak of orange hairs before inner margin; traces of an outer line from costa before apex; a subterminal darker line, dentate between veins 4 and 3, and 3 and 2. Wings below yellow irrorated with reddish brown; fine black lines on discocellulars; fore wings with a fine reddish brown line from apex to inner margin beyond middle; hind wings with a similar line from apex to inner margin nearer middle.

Expanse 40 mm.

Habitat.—Minas, Brazil.

Type.—Cat. No. 24920, U. S. Nat. Mus.

Near *P. circumstans* Walker.

Hylesia minasia, new species.

Male.—Head cinnamon rufous. Collar and thorax dark purple drab; some cinnamon hairs in front of collar. Abdomen above black, the base hazel, the anal segment cinnamon. Body below pale cinnamon, the fore legs purple drab. Fore wings pallid purple drab; base broadly shaded with dark purple drab except on costa, limited by a slightly darker antemedial tint, vertical but inangled in cell, closely followed by a fuscous parallel medial line from subcostal to inner margin; a fuscous streak on discocellular; postmedial brownish drab slightly curved on costa then almost vertical to inner margin; a broad subterminal purple drab shade only slightly darker

than ground color; cilia except at apex and tornus darker. Hind wings light grayish vinaceous, the termen tinted with pallid purple drab. A very faint postmedial drab line, and a darker better marked subterminal line. Wings below duller without markings.

Expanse 42 mm.

Habitat.—San Lourenco, Minas, Brazil.

Type.—Cat. No. 24921, U. S. Nat. Mus.

The only allied form I know is an undescribed species in collection Dognin.

Received from Mr. E. May of Rio de Janeiro.

Family CERATOCAMPIDÆ

Adelocephala subfumata, new species.

Male.—Head and thorax avellaneous with a fuscous dorsal line on collar and thorax. Abdomen dorsally red, otherwise avellaneous. Fore wings avellaneous; lines fine, fuscous; antemedial line slightly outbent, and lunular, inangled above submedian, followed by a black transverse line in cell; a small black point at end of cell; postmedial line inversely lunular from costa before apex to above submedian where it is out-curved to inner margin at two thirds from base; the two lines are connected by a short black streak above submedian; a faint medial curved brownish shade from middle of costa to middle of inner margin; an irregular subterminal series of fuscous spots. Hind wings avellaneous, the cell, below it, and beyond to termen somewhat browner; a postmedial lunular fuscous line; subterminal fuscous spots more heavily marked than on fore wing. Fore wings below buff, the costal margin shaded with purple; the subterminal line not so deeply lunular as above. Hind wings long and narrow, the costa highly arched at base; more than half the wing anteriorly fuscous purple, crossed by a broad antemedial lilacine shade; a white point at end of cell; posterior portion of wing avellaneous; a wavy dark postmedial line, and traces of subterminal spots.

Expanse 50 mm.

Habitat.—Joinville, South East Brazil.

Type.—Cat. No. 24922, U. S. Nat. Mus.

Quite unlike any described species.

Family NOTODONTIDÆ

***Lusura speciosa*, new species.**

Male.—Palpi reddish brown, darkest above and with a white tuft above at base of third joint. Frons brown becoming white towards palpi; vertex and tufts mottled brown, black, and white. Collar and sides of thorax deep olive gray. Abdomen dark brown above, whitish underneath. Fore wings with the costal margin to near apex and cell to medial line cinnamon rufous, the inner margin broadly deep olive gray, the termen dull olive gray; a black line below subcostal to medial line, but bifurcating beyond base, the lower branch being dark reddish brown; a claret brown line from base edges the gray inner margin and is interrupted at medial line by a small white semilunar mark, beyond which it is downbent and toothed before reaching tornus, then upbent and incurved obliquely with a short tooth at vein 4, then nearly reaches termen at vein 7 and is inbent to costa, leaving a gray spot on costa at apex; where angled at vein 7 a fuscous spot follows to apex which appears like a continuation of the line; the medial line is fuscous brown preceded by a narrow dark shade in cell and followed by a claret brown velvety line, punctiform, edged with white on costa; from cell veins 4–6 are fuscous with grayish streaks above and below vein 5; postmedial space between 2 and 4 purplish brown; traces of a postmedial fine line crossing a white spot on costa, and traces of another line well beyond it; the inner margin is crossed by fine, geminate antemedial and postmedial lines. Hind wings white, the inner margin broadly dark brown, the termen very narrowly shaded with brown. Wings below whitish the apex and termen of fore wing shaded with brown.

Expanse 35 mm.

Habitat.—Joinville, South East Brazil.

Type.—Cat. No. 24923, U. S. Nat. Mus.

Lusura ancha, new species.

Female.—Head and thorax mottled gray and fuscous. Abdomen above fuscous gray, the basal segment orange brown. Body below avellaneous. Wings fuscous gray. Fore wings: a geminate black brown basal line on costa; a short black streak on median and one below it; very faint traces of antemedial line; a fine, faint, medial line slightly wavy, closely followed by a fine distinct black line from costa to below cell where it is edged with whitish and does not reach submedian fold; a short dark streak connects this line with a black lunule near end of cell; two dark points on discocellular followed by four small whitish spots; a black postmedial line outbent from costa to vein 6, then inbent and macular, the spots somewhat triangular and followed by whitish gray indistinct spots on interspaces; a subterminal wavy black line, the veins partly streaked with black; cilia grayish, on inner margin medially tipped with black. Cilia on hind wings white with dark spots at veins. Wings underneath grayer without markings; the costa of fore wing narrowly cream color; cilia white with dark points on both wings.

Expanse 40 mm.

Habitat.—Trinidad, Paraguay.

Type.—Cat. No. 24924, U. S. Nat. Mus.

Wings broader than in the other species of this genus, and the general character of markings different.

Received from Mr. Pedro Jorgensen.

Hemiceras sericilinea, new species.

Male.—Body above pale buff, underneath whitish buff. Palpi brown above, white below. Frons brownish irrorated with white; a white line behind and white tufts at base of antennæ. Vertex cinnamon brown. Collar antimony yellow. Legs mostly white, the tarsi brown. Fore wings pale buff, silky, thinly irrorated with reddish brown, the inner margin straight; costal margin finely orange brown; a fine antemedial orange brown line, vertical, not reaching costa or inner margin; a small brown spot at end of cell circled with fuscous brown;

outer line from apex to middle or inner margin, orange brown, inwardly shaded with gray brown, outwardly edged with whitish buff; subterminal points at veins 3 and 4; cilia dark orange brown. Hind wings whitish, the termen and base of cilia tinged with brownish ochre which extends upwards along inner margin. Wings below buff white, the spots and outer line of fore wing showing through; cilia of fore wing dark orange brown, of hind wing white. No fovea.

Expanse 45 mm.

Habitat.—Petropolis, Brazil.

Type.—Cat. No. 24925, U. S. Nat. Mus.

Near *H. leucospila* Walker.

What I consider the female has the fore wing slightly darker, the antemedial line slightly inbent and only a few brown scales at end of cell instead of the annular spot; the postmedial line is similar to that line in the male, also the cilia. Hind wings yellowish white without terminal shading, the vertex and collar darker brown, the legs light brown, also the palpi below. Underside as in male.

Expanse 53 mm.

Habitat.—Nova Friburgo, Brazil.

Hemiceras pohli, new species.

Male.—Palpi dark reddish brown above, whitish buff underneath. Frons lilacine gray. Thorax and fore wings deep olive buff irrorated with reddish brown, front of collar brown. Abdomen above reddish brown. Body below whitish buff. Fore wings: antemedial line vertical, faintly yellowish with black points on veins; a round dull gray spot at end of cell; outer line from apex to middle of inner margin faintly yellowish with reddish and black points on veins, inwardly shaded with dull fuscous gray beyond cell, and similar shadings on termen. Hind wings whitish, the veins and termen broadly shaded with reddish brown; a dark brown fovea at vein 2. Fore wings below whitish shaded with red, disk brown except at apex and on inner margin. Hind wings below whitish.

Expanse 44 mm.

Habitat.—City of São Paulo, South East Brazil.

Type.—Cat. No. 24926, U. S. Nat. Mus.

The inner margin of fore wing is straight. This species can be placed near *H. leucospila* Walker.

Received from Mr. Bruno Pohl.

Family LIPARIDÆ

Trochuda amalita, new species.

Male.—Head, collar and thorax vinaceous cinnamon, the thorax posteriorly more purplish. Abdomen white, the dorsal tufts pinkish. Fore wings vinaceous cinnamon crossed by two straight fine brownish lines; the inner line slightly inbent from costa, the outer line from apex to just beyond middle of inner margin. Hind wings white, the termen broadly shaded with roseate. Fore wings below paler, the inner margin white; only the outer line which is fuscous and broader. Hind wings below pale buff, the inner margin broadly white; a fine dark postmedial line, curved below apex, not extending below vein 2.

Expanse 30 mm.

Habitat.—Nova Friburgo.

Type.—Cat. No. 24927, U. S. Nat. Mus.

The lines as in *T. impura* Schaus, but the color quite different.

Family MEGALOPYGIDÆ

Megalopyge flavivertex, new species.

Male.—Antennæ with basal third of shaft brown, beyond white, the pectinations brown tipped with white. Palpi and throat black; frons whitish gray with lateral black lines; vertex bright yellow; collar black broadly edged behind with bright yellow. Thorax black. Abdomen gray black; the base dorsally black, the four medial segments dorsally with transverse white bands. Legs fuscous with whitish gray shadings. Fore wings fuscous on basal half, with fine white lines, two on costa not reaching base, two in cell, and three below cell between median and submedian veins, these last three shorter, outlining two small elongated spots; a velvety black spot at

end of cell; this basal half is limited by a white line vertical from costa to vein 5, indented to vein 3, and slightly outbent to inner margin, and inwardly heavily shaded with black except between veins 5 and 3; outer space white with fuscous gray lines above and below veins, suffusing before touching termen. Hind wings white, the base, inner margin, and veins terminally fuscous gray. Fore wings below with the outer area whiter, only the lines at apex very distinct. Hind wings below with the basal area darker than above; cilia fuscous on all the wings.

Expanse 35 mm.

Habitat.—São Paulo, South East Brazil.

Type.—Cat. No. 24928, U. S. Nat. Mus.

Very similar to *M. lampra* Dyar from Mexico. The black markings more intense, the spots on the vertex and collar bright yellow instead of white.

Received from Mr. Bruno Pohl.

NEW SPECIES OF JAPANESE CRANE-FLIES

PART II

(*Diptera*, *Tipulidæ*)

By CHARLES P. ALEXANDER

The undescribed species of crane-flies discussed in this paper were included in material sent to the writer for determination by Dr. T. Shiraki. The specimens are mostly from Teshio, northern Hokkaido, and were collected by Mr. T. Isshiki. My sincere thanks are extended to Dr. Shiraki and Mr. Isshiki for the privilege of studying these collections. The types are preserved in the collection of the writer; additional specimens are in the Entomological Collection of the Agricultural Experiment Station of Formosa.

There are a few names of Oriental *Tipulidæ* that require to be changed since they are primary homonyms of earlier names in the same family. These homonyms were created by Brunetti. The writer had notified Mr. Brunetti of this fact but as he does not consider it necessary to re-name these forms (Rec. Ind. Mus., vol. 15, p. 274, 1918), it devolves upon the

writer to propose these new names. Although Brunetti has failed to subscribe to this principle advocated by the International and other codes, he has inadvertently done so in re-naming *Ctenacroscelis pallidus* (Walker) as *C. borneensis* (Brunetti). The following species are herewith re-named as being primary homonyms of earlier names in the same genus:

Limnobia garoensis new name for *Limnobia longipennis* Brunetti (Rec. Ind. Mus., vol. 15, pp. 292, 293, 1918), nec *L. longipennis* Schummel (Beitr. zur Entomol., vol. 1, p. 104, 1829).

Limnobia brunettii new name for *Limnobia nigra* Brunetti (Fauna Brit. Ind., Dipt. Nemat., p. 404, 1912), nec *L. nigra* Wiedemann (Aussereur. zweifl. Ins., vol. 1, p. 27, 1828).

Erioptera bengalensis new name for *Erioptera flava* Brunetti (l. c., p. 455), nec *E. (Empeda) flava* (Schummel) (Beitr. zur Entomol., vol. 1, p. 148, 1829).

Limnophila (Dicranophragma) venustipennis new name for *L. (D.) pulchripennis* Brunetti (l. c., p. 524), nec *Limnophila pulchripennis* Meunier (Mon. Tipulidæ et Dixidæ de l'Ambre Baltique, p. 379, 1906).

Tipula perelegans new name for *Tipula elegans* Brunetti (l. c., p. 323), nec *T. elegans* Fabricius (Syst. Antl., p. 26, 1805).

Genus LIBNOTES Westwood

Libnotes longistigma, new species.

Male.—Length, 15 mm.; wing, 21.5 mm.

Close to *L. strigivena* (Walker) but much larger.

Rostrum and palpi dark brown. Antennæ with first segment dark brown; flagellar segments oval, pale brownish yellow. Head fawn colored.

Mesonotum fawn colored with greenish tints; lateral margin broadly blackened, these lines passing beneath the root of the halteres to the abdomen, not suffusing anterior end of

praescutum. Pleura yellow; linear brown marks on pro- and mes-episterna. Legs with the coxæ yellow, outer face of fore coxa conspicuously dark brown; femora yellow with the tips conspicuously darkened, the coloration most intense as a narrow dark brown subterminal ring; tips of tibiæ dark brown. Wings as in *L. strigivena*; stigma very elongate.

Abdomen with tergites brownish fawn color, trilineate with dark brown; median stripe interrupted at the posterior margin of the segments and becoming obsolete behind.

Habitat.—Japan.

Holotype, male, Koto sho Islands, Formosa, March 15–April 10, 1920 (T. Okuni).

Genus LIMNOPHILA Macquart

***Limnophila (Phylidorea) sapporensis*, new species.**

Male.—Length, 8.5 mm.; wing, 8.7 mm.

Belongs to the *ferruginea* group; allied to *L. melanommata* Alexander.

Rostrum and palpi dark brown. Antennæ with the first segment dark brown, sparsely pruinose; remainder of antennæ yellow, the terminal segments a little darkened. Head gray.

Pronotum brown. Mesonotum ferruginous, the praescutum with a capillary dark brown median stripe, broadest in front, gradually narrowed posteriorly, becoming obsolete before the suture; posterior margin of scutellum margined with brown. Pleura orange yellow. Halteres yellow, the knobs a little darker. Legs with the coxæ and trochanters yellow; femora dark brown, the bases obscure yellow, broadest on the posterior femora where they include about the basal third; remainder of legs brown. Wings with a faint yellowish tinge, more saturated in the costal and subcostal cells; stigma and wing-apex faintly darkened. Venation: As in the *ferruginea* group; cell 1st M_2 small, subrectangular; cell M_1 a little longer than its petiole.

Abdomen brownish yellow, the seventh to ninth segments dark brown, including the hypopygium.

Habitat.—Japan.

Holotype, male, Sapporo, July 27, 1908 (T. Shiraki).

Genus PSELLIOPHORA Osten Sacken

Pselliophora galeata, new species.

Male.—Length, about 14 mm.; wing, 13.3 mm.

Generally similar to *P. isschikii* (Matsumura), differing as follows: Antennal flagellum uniformly dark brown; first flagellar segment dark brown, the pectination much longer than in *P. isschikii*. Mesonotal praescutum with three conspicuous brownish black stripes; each scutal lobe with two confluent brownish black spots. Legs with the femoral tips narrowly dark brown; tibiae and tarsi dark brown, the bases of the tibiae brighter. Wings yellow, the apex of each dark brown; bases of cells R_2 , R_3 , R_5 , M_1 and 2nd M_2 of the ground-color. R_s much shorter and more strongly arcuated than in *P. isschikii*, feebly spurred at origin; inner end of cell 1st M_2 nearly square. Abdomen orange with a narrow dark brown stripe, expanded on the eighth and ninth tergites to cover the entire sclerites. Male hypopygium with the eighth sternite projecting caudad and ventrad into a conspicuous hood-shaped structure.

Habitat.—Japan.

Holotype, male, Oshima, Honshu, July 16, 1918 (T. Shiraki).

Pselliophora septentrionalis, new species.

Male.—Length, 15 mm.; wing, 14.4 mm.

Generally similar to *P. isschikii* (Matsumura), differing as follows: Antennal flagellum bicolorous, the stem of each segment fulvous, the pectinations and terminal segments black. Body entirely a deep shiny fulvous, without markings. Legs entirely yellow. Wings yellow, the apex of each in cells R_2 , R_3 and R_5 weakly infuscated. R_s long, gently arcuated at origin. Male hypopygium with the eighth sternite not at all projecting.

Habitat.—Japan.

Holotype, male, Teshio, July 12, 1916 (T. Isshiki).

Paratype, male, Chuzenji, July 21, 1910 (Edme. Gallois).

The paratype is in the Paris Museum and was included in material sent me for determination by Mons. Eug. Séguy. It is a large male (length, 20 mm.; wing, 18 mm.) which agrees in all essential details with the type above described.

Genus TIPULÆ Linnæus

Tipula isshikii, new species.

Male.—Length, 13.5 mm.; wing, 16 mm.; antenna about 9 mm.

Frontal prolongation of head gray pruinose above, light brown laterally; palpi pale brown. Antennæ with the scape yellow; first flagellar segment brownish yellow; remainder of flagellum brownish black; antennæ of male unusually elongate, if bent backward extending to about opposite base of fourth abdominal segment. Head light gray.

Mesonotal praescutum buffy plumbeous with four brown stripes, the intermediate pair split by a capillary pale line, the lateral and intermediate stripes practically confluent; scutum gray, lobes darker gray; scutellum dark testaceous brown; postnotum gray. Pleura dark with a pale, longitudinal, ventral stripe, the entire pleura heavily pruinose; mesosternum dark. Halteres obscure yellow; knobs a little darker. Legs with the coxæ gray pruinose; trochanters yellow; femora brownish yellow, soon passing into the broad, dark brown tips; tibiæ brown, the tips darker; tarsi dark brown. Wings brownish subhyaline, the base and cells *C* and *Sc* more yellow; stigma dark brown; faint and indistinct brown seams along the cord; an oblitative area before the stigma and a second crossing cell *1st M*₂. Venation: *Rs* a little longer than *R*₃; *R*₂ persistent; petiole of cell *M*₁ longer than *m*; *m-cu* distinct.

Abdomen yellow at base, gradually darkening to the dark brown apex, this latter including segments six to nine; lateral margins of tergites four to seven rather broadly pale, margined internally by a narrow, blackish line that widens out on the posterior segments. Male hypopygium with the ninth

tergite extensive, the caudal margin with a broad U-shaped median notch, the lateral lobes broadly and obtusely rounded; at base of the U-shaped notch beneath are two triangular chitinized lobes that lie parallel and close together, the tips subacute. Pleural suture indicated only beneath; pleural appendages large, blackish. Ninth sternite profoundly incised medially, the caudal margin of each half provided with abundant long, yellowish, decussate setæ. Eighth sternite unarmed.

Habitat.—Japan.

Holotype, male, Teshio, July 12, 1916 (T. Isshiki).

***Tipula shogun*, new species.**

Female.—Length, about 18 mm.; wing, 20.8 mm.

Frontal prolongation of head relatively short, dark brown, nasus distinct; dorsum of prolongation pruinose. Antennæ with scapal segments buffy; flagellum dark brown. Head light gray, more buffy surrounding the antennal bases.

Mesonotum light gray, the praescutum with four narrow brown stripes; scutal lobes with two dark gray spots. Pleura light gray, the dorso-pleural membrane obscure yellow. Halteres yellow. Legs with the coxæ gray; trochanters yellow; remainder of legs dark brown, the femoral bases yellowish, narrowest on the fore legs. Wings yellowish subhyaline, the costal and subcostal cells yellow; stigma dark brown; a faint and sparse gray clouding in the ends of cells R_2 , R_3 , R_5 and in the anal cells; cord narrowly seamed with brownish gray; veins brown, more yellowish in the costal and subcostal cells. Venation: R_s long, straight; cell R_2 comparatively large; cell 1st M_2 small; first section of M_3+4 shorter than $r-m$.

Abdominal tergites obscure yellow, with a conspicuous dark brown median stripe, beginning on the first segment, on the terminal segments broadening out and suffusing the entire sclerites; on tergites two to four there are indistinct brown sublateral blotches; terminal tergites more or less pruinose; sternites buffy; last segment gray. Ovipositor small, valves fleshy. Tergite terminating in two slightly divergent pale flaps; sternal valves very short.

Habitat.—Japan.

Holotype, female, Teshio, July 3, 1916 (T. Isshiki).

Tipula teshionis, new species.

Male.—Length, about 18 mm.; wing, 22–23 mm.

Frontal prolongation of head brown, gray pruinose dorsally; palpi dark brown. Antennæ short; scapal segments yellowish testaceous; flagellar segments subunicolorous, dark brown, the basal enlargement a little darker than the remainder of each segment. Head gray with a capillary brown median line on the vertex; anterior part of vertex, surrounding the eyes, yellowish.

Mesonotal praescutum obscure brownish yellow with four brown, gray pruinose stripes; scutum gray, each lobe with two darker gray marks; scutellum brownish gray; postnotum gray, the median portion with a brownish gray inverted triangle that is produced into a point to the caudal margin. Pleura dark brown with a whitish gray longitudinal stripe passing above coxæ and beneath halteres; dorso-pleural membranes broadly buffy yellow; mesosternum largely dark. Halteres yellowish brown. Legs with the coxæ gray pruinose; trochanters yellow, the apices beneath with a dark brown spot; femora brownish yellow, the tips broadly brownish black; remainder of legs reddish brown, passing into black on the tarsi. Wings with gray and brown spots and clouds on a subhyaline ground; stigma and a spot at origin of *Rs* brown; a brown cloud along cord and near midlength of vein *1st A*; subhyaline spots near the ends of cells *M*₁, *2nd M*₂, *M*₄, *Cu*₁, two in cell *1st A* and one in *2nd A*; an oblique pale line across cell *M*; bases of cells *R*₂, *R*₃, *R*₅, *M*₄ and *Cu*₁ and most of cell *1st M*₂ pale; apical two-fifths of cell *R*₅ pale.

Abdominal tergite one brown; segments two to five reddish brown, the lateral margins of the tergites rather narrowly pale, bordered internally by a narrow brown line; remainder of abdomen dark brown; sternites gray pruinose. Male hypopygium with the ninth tergite transverse, not blackened; caudal margin with a very small and shallow median notch, the lateral angles of which are produced ventrad into conspicuous

black spines; the margin of the notch is provided with short inconspicuous yellowish setæ. Pleural appendages conspicuous, appearing as curved paddle-like blades that jut across the genital chamber, each one before its tip on the caudal margin with a prominent spinous lobe.

Habitat.—Japan.

Holotype, male, Teshio, July 5, 1916 (T. Isshiki).

Paratopotype, male, July 4, 1916.

MISCELLANEOUS SPECIES OF CHALCID-FLIES FROM AUSTRALIA

(*Hymenoptera, Chalcididæ*)

By A. A. GIRAULT

The following new forms are from Queensland, but have not yet been subjected to final revision.

Eupelmus aesopi, new species.

Like *australiensis*, but ovipositor only one-third abdomen, minute dot on hind knee and just below it. Yellow abdomen margined narrowly from base nearly to apex. Funicle 1 white, 4 twice longer than wide.

Forest, Tumoulin, March 12, 1919.

Neanastatus aeschyli, new species.

Like *maximicorpus*, save minor details and: Femur 3 aeneus save widely at apex, thorax concolorous, lateral ocellus distinctly closer to eye than to cephalic ocellus.

Forest, Ipswich, August, 1919.

Anastatus aeschyli, new species.

Stature of *benthami*, but wings hyaline, scape pale distal half, so tibiæ and femur 2 save upper edge, tibia 2 save a spot dorsad just below knee.

Jungle, Ravenshoe, March 13, 1919.

Ablerus punctatus, new species.

Like *venustulus*, but green, hind legs reddish brown save coxæ, others green save knees, tibial tips widely and the tarsi,

club black, antenna brown, wing-stripe oblique, distinct, characterized by densely punctate dorsum of thorax.

Mountain foot-hills, Nelson, forest, April.

Neorileyella bella, new species.

Like genotype, but distal scutellum very dark, antennæ dark, scape and club white, abdomen 2 and 3 at apex dark, so propodeum save far laterad.

Waugh's Pocket, September, jungle.

Eupelmus muramura, new species.

Slender, abnormal, but as *Eupelmus*. Ovipositor half abdomen, featherly above at about basal half. Purple, middle tibial spur, tarsus 2 and middle joint of 3, white. Fore wing sooty from bend of submarginal nearly to apex, with two longitudinal clear streaks. Head wider than long, eyes round, bulging, antennæ middle of face, scape far above vertex, dilated. Funicle 2 twice longer than wide, longest.

Forest, Tumoulin, March 13, 1919.

Stomatoceras bergeraci, new species.

Characterized by bearing on scutellum a median groove and a short golden pubescence on thorax. Black, punctate. Tegula, legs save hind coxa above, lateral aspect of hind femur sometimes (except widely at each end) and antennæ except funicles 4-8, red. Fore wing marked as in *victoria*.

Brisbane, H. Hacker.

Stomatoceras livii, new species.

Like *carlylei*, but tegula black, fore wings as in *victoria*, funicle 1 barely longer than wide, shorter than pedicel, 2 longest, twice longer than wide, equals 3, 1-3 red, abdomen black.

Darra, H. Hacker.

Eupelmus inkaka, new species.

Like *scudderi*, but abdomen yellow, margined from base to apex above.

Brisbane, Hacker, forest.

Eupelmus dodo, new species.

Like *folsomi*, but abdomen margined down the whole of its side.

With *E. inkaka*.

Eupelmus tennysoni, new species.

Like *dumasi*, but ovipositor nearly as long as abdomen, tibiæ 1 and 3 metallic save distal third, tibia 2 with spot below knee, femur 3 white at apex. Funicle 2 longest, twice longer than wide.

Nelson, jungle, January 8, 1919.

Ablerus nelsoni, new species.

Like *poincarei*, but ovipositor white at apex, fore wings distally wider, 24 lines cilia, fringes relatively shorter, 6-7 lines of coarser under marginal. Scape, pedicel save above at base, funicles 2-4 white. Head so, green below antennæ.

Meringa, window, February.

Signiphora ruskini, new species.

Like *australica*, but legs orange, fore wing infuscated throughout with exception of a small oval near caudal margin opposite end of marginal, the apex narrowly and an indistinct, narrow stripe across from end of venation.

Nelson, forest, March 6, 1919.

Aphelinus voltairei, new species.

Like *Eutrichesomella* genotype, but head and dorsal thorax orange, basal stripe of abdomen represented by a large, wider than long marginal spot a little out from base, the distal stripe is across just before apex; propodeum silvery, of thorax only mesopleurum dusky. Funicle 3 distinct from the solid club. Eyes normal. Club a bit exceeding funicle. Scutellum with four large setæ. Position somewhat uncertain.

Goondi, Johnstone River, in jungle, September.

Eretmocerus australis, new species.

Orange, fore wings slightly infuscated to end of stigmal. Funicles equal, a third wider than long. Hind wing naked, 2

lines of cilia cephalad, 1 caudad. Fore wing 13 lines discal cilia, fringes a bit over one-third width. Pedicel over twice longer than wide, not half the club. An isolated line of cilia caudo-proximad from apex of stigmal. Resembles the other species, but may be native and distinct.

Nelson, window, February.

Apteroptrix aspidiotiphagoidea, new species.

Like an *Aspidiotiphagus*. Golden, wings faintly stained across from marginal; axillæ, pronotum save meson not very widely and center of mesopleurum, black. Funicles 1 and 3 equal, half longer than wide, 2 quadrate; clubs twice longer than wide. Seven lines dot-like discal cilia, fringes subequal width. Abdomen above subdusky.

Nelson, January.

Exoclaenoides mutilloides, new species.

Violaceous, wings sooty, following crimson: Distal half of abdomen's body (last two segments, 4 and 5 save cephalic edge of 4), base of abdomen above at meson, a round spot on abdomen 2 dorso-laterad a bit distad of middle; knees, tibiæ, tarsi and apex coxa 3 (save lateral aspect tibia 1), a long, transverse mark across pronotum at cephalic margin, tegulæ. Apical club reddish. Scape yellow save laterad centrally and above toward base. Ten femoral teeth, one large. Like genotype.

Brisbane, Hacker.

Ophelosia lucretii, new species.

Like others, but honey, abdomen purple, legs and propodeal neck, paler, latter very finely shagreened, large. *No ring-joint*, funicles shorter than pedicel, 1 somewhat wider than long, 5 wider yet. *Mandible weak, edentate*. Thorax scaly, scutellum with four bristles, scutum with short pile. Discal cilia dense distad, fringes distinct. Head cross-wrinkled only above antennæ. Club dark.

Jungle, Inkerman, December 9, two females.

Amonodontomerus iucundus, new species.

As *silvae*, but larger, ovipositor one-third abdomen, coxæ,

femora save tips, concolorous, propodeum without median furrow, petiole quadrate; scape, pedicel above green. Abdomen 4 longest, then 2, then 3, 4 a fourth the surface. Funicles 1-2 unequal.

Forest, Herberton, March.

Rhcnopeltella gemma, new species.

Like *acuminata*, but tibiæ concolorous, pedicel twice funicle 3, funicles 2 and 3 abruptly largest, quadrate. Mandibular teeth equal subacute. Postmarginal elongate.

Herberton, forest, March.

Amonodontomerus silvae, new species.

From genotype thus: Club 3-jointed, antennæ below middle of face, head smooth, also abdomen, petiole transverse; scutellum glabrous distad of cross-suture; funicle 1 twice wider than long; club 1 less than that region. Propodeum with median and lateral grooves, latter rather close to meson. Abdomens 2-4 equal, forming four-fifths surface. Postmarginal equal marginal, the rather long stigmal half shorter. Mandible acutely tridentate. Pedicel green above save tip, the funicles are much wider than long.

Forest, Watsonville, March.

Grotiusella eja, new species.

Dark green. Lateral ocellar spots, head below eyes, margins scutellum save meson widely cephalad, margins of post-scutellum save cephalic and a curved line from scutellum up scutum along mesal side axilla, golden. Antennæ, legs concolorous save basal half scape, first four legs save bases of coxæ and tibiæ more or less at base, tarsi 3, tibiæ 3 at apex and narrowly ventrad. A stripe connecting antennal fossæ. Wings hyaline. Mandible 9-dentate. Cheeks yellow. Funicle 1 quadrate, others over twice wider than long. Median carina on propodeum.

Waugh's Pocket, September 19, 1918.

Dinocarsis bella, new species.

Like *subflaviceps*, but funicles 3-6 save base of 3 white,

club brown, rest jet save marking on scape; legs silvery, femora 2 and 3 with narrow black streaks above and below and a dot on knee 2. Mesopleurum and scutum laterad edged with black; tegula, prepectus silvery.

Babinda, jungle, September.

Dinocarsis spica, new species.

Like *bella*, funicles 2–3 also white, apex pedicel more distinctly so, club white, legs, cheeks immaculate.

Jungle, Nelson, October.

Hetreulophus voltairei, new species.

Like genotype save abdomen with purple cross-stripes apex 2–4, each failing laterad; thorax orange with a purple square at mesal base of scutellum; last four antennal joints black, funicle 7 over twice longer than wide, 1 twice 7, subequal pedicel. A second smaller clump hairs on fore wing proximad of the first from which an infuscation proceeds to middle of wing; infuscation forms a fleur-de-lis (hyaline areas—between two hair-clumps), against whole of marginal with an opposite, reciprocal area caudad; apex; against distal half postmarginal with reciprocal opposite, these joined to apical hyaline. Head as in *Eupelmus*.

Little Mulgrave River, jungle, August 25, 1918.

Miscogasteromorpha eja, new species.

Like *ajax*, but abdomen orange, with a solid marginal stripe above from base a little distad of middle (apex of 4) and four cross-stripes, 1 apex of segment 2, others occur apex of next segments, 4 just distad of end of marginal stripe. Coxa 2 pale, others purple basal half.

Meringa, jungle, November.

NEW AMERICAN MOTHS

(Lepidoptera)

By HARRISON G. DYAR

Family LIMACODIDÆ

Natada miradora, new species.

Thorax dark brown, the head and dorsum of abdomen tinged with dark red. Fore wing dark brown, with a glossy sheen through the middle, which widens broadly on the inner margin; a blackish discal dot; outer line slender, tremulous, from costa before apex, exserted and diffused below. Hind wing lighter brown, with some purple in the fringe beyond anal angle. Beneath wood-brown, sparsely irrorated with black, especially on hind wings. Expanse, 27 mm.

Type, male, No. 24872, U. S. Nat. Mus.; Mirador, Mexico, June, 1921 (R. Müller).

Nearest *N. increscens* Dyar, smaller, the outer line less rigid.

Semyra frances, new species.

Dark brown; fore wing with an erect silvery line, entering cell, to near inner margin, irregular, narrow, indented on submedian fold; a round red spot beyond it below median vein; outer line whitish, slender, tremulous, pointed to margin below apex, squarely reëntrant at vein 2, preceded by brown dashes and followed by brown at apex; a clouded brown marking at end of cell. Hind wing uniform, a little lighter. Expanse, 19 mm.

Type, female, No. 24873, U. S. Nat. Mus.; Formosa, Argentina (P. Jorgensen). Named for Miss Frances M. Appleby.

Nearest to *S. eucharista* Dyar, smaller, the hind wing without any red tint.

Semyra phrygia, new species.

Markings as in *S. paula* Dyar. Darker brown, without red tint, a little larger, the discal wedge more fully trigonate. Expanse, 24 mm.

Type, male, No. 24874, U. S. Nat. Mus.; São Paulo, Brazil, October 24, 1915.

I am using a manuscript name attached by Mr. William Schaus. The specimen was received by him from a private collector.

Claphidia microstagma, new genus and species.

Male antennæ simple; middle spurs of hind tibiæ present; palpi reaching slightly above the vertex; fore wing with veins 7 to 10 stalked; hind wings with veins 6 and 7 long stalked, almost coincident.

Fore wing dark velvety brown at base, the area occupying one-third of the costa, bulging out below and obsolete below submedian vein, containing on this vein a small white dot, nearly at the middle of the wing; rest of wing black-powdered on a clay-colored ground, the ground appearing as two curved lines, one just beyond the dark patch, the other outwardly, crenulate and diffused; a row of terminal dashes on the veins, connected by a line. Hind wing dark brown, the veins darker, and dark terminal line; fringe light with slight interline. Expanse, 23 mm.

Type, male, No. 24947, U. S. Nat. Mus.; Buena Vista, Bolivia, further data missing (gift of B. Preston Clark).

The genus is near *Venadicodia* Dyar, but the stalking of the subcostal venules is more pronounced and the wings are trigonate, of normal shape, not square with subparallel margins as in *Venadicodia*.

Family PYRALIDÆ

Subfamily CRAMBINÆ

Diatraea tripsacicola, new species.

A large heavy species with the wing-pattern of the male of *Diatraea saccharalis* Fab., similar in the two sexes.

Fore wing straw-color, the veins lined with brown, and with brown lines between the veins; two lines in the cell, and a round black discal spot at the end; lining in the interspace between veins 5 and 6 weak; terminal black dots in the interspaces; two outer brown curved lines, indicated by spottings on the veins, not on the interspaces, obsolete above. Hind

wing pale brownish, darker shaded on the costal region, the veins narrowly dark there; traces of terminal dots at the inter-spaces. Expanse, male, 35 mm.

The female is marked like the male, except that the two outer lines are absent; the intervenular lines are darker than those on the veins, this character being present also in the male, but less pronounced. Hind wing creamy white, with traces of dark costal veins and terminal dots. Expanse, 43 mm.

Bred from larvæ in canes of *Tripsacum laxum* at Miami, Florida; male, April 20, 1919 (A. C. Mason), female, February 12, 1921 (W. B. Wood), three males, September 27, 1921 (W. B. Wood). The plants of *Tripsacum* were originally brought from Guatemala; but as they were grown in quarantine from June to October, 1916, without sign of infestation, before being released for planting, it is not certain that the *D. tripsacicola* originated in Guatemala.

Type, No. 24900, U. S. Nat. Mus.

Mr. Carl Heinrich has kindly made a mount of the male hypopygium, and reports that the structure is of the type of *zeacolella* Dyar, rather than that of *saccharalis* Fab., possessing differential characters from both. The distinctness of the species is indicated, however, without this information.

NOTE ON CULEX DECLARATOR D. & K.

(Diptera, Culicidæ)

By HARRISON G. DYAR

Dr. and Mrs. Bonne stated in this magazine (Ins. Ins. Mens., ix, 21, 1921) that *Culex bilineatus* Theob. and *Culex virgultus* Theob. were identical with *Culex declarator* D. & K., and I arranged the synonymy to correspond with this statement (Ins. Ins. Mens., ix, 29, 1921). It appears, however, that this is incorrect. Mr. F. W. Edwards informs me that the Brazilian form is distinct, and I suppose that Dr. and Mrs. Bonne may have been depending upon memory for the characters of *declarator*. In any case the distinctions are marked. Accord-

ing to Mr. Edwards' sketch, the teeth of the mesosome are much smaller in *virgultus* than in *declarator*, while the tenth sternites in *declarator* have the spines all pointed and the basal arm straight, but in *virgultus* the basal arm is curved, and the spines on that side of the apex are broad and flattened, as in *nigripalpus* (= *factor*). The synonymy will therefore stand as follows:

***Culex virgultus* Theobald.**

Culex virgultus Theobald (1901).

Culex bilineatus Theobald (1903).

***Culex declarator* Dyar & Knab.**

Culex declarator Dyar & Knab (1906).

Culex inquisitor Dyar & Knab (1906).

Culex proclamator Dyar & Knab (1906).

Culex jubillator Dyar & Knab (1907).

Culex revelator Dyar & Knab (1907).

Culex vindicator Dyar & Knab (1909).

Culex dictator Dyar & Knab (1909).

I have recently received for identification by the kindness of Mons. E. Séguy of the Paris Museum, several specimens of a *Culex* from Montevideo, Uruguay (P. Serre, 1912) which is evidently *virgultus*. The general appearance does not suggest *declarator* at all, there being no white rings on the tarsi, nor bands on the abdomen. The specimens are stout, with brown tint, without the greenish tinge so frequent in *declarator*.

In the male genitalia the clasper is stout and broad at the base; apical lobe of side-piece prominent, bearing three strong rods, a leaf and a seta, and a long seta. Mesosomal plate with a pointed upper limb, a lower curved pointed limb, with a broad short tooth between, third plate arising from the center, with excavated base, forming a horn similar to the other teeth, thus producing an appearance similar to that of *declarator*, with three teeth and a small one. Tenth sternites with the branch long and strongly curved, the spines tufted, but the outer two tooth-like. In *declarator*, however, the three large teeth all arise equally from the margin of the plate, representing the toothed margin and not the structure that I called the third plate.

THE LARVA OF BASILODES PEPITA GUENÉE*(Lepidoptera, Noctuidæ)*

By HARRISON G. DYAR

These larvæ were first noticed near Washington, D. C., by Mr. A. N. Caudell about 1911. The writer accompanied him to Chain Bridge September 17, 1912, and collected a number on a tall coarse weed which proves to be *Verbesina alternifolia*. No adults were reared by either of us, and a suitable opportunity for collecting did not recur. A larva was preserved by Mr. H. S. Barber from Black Pond, Virginia, October 18, 1920, but breeding was not attempted. In the fall of the same year Mr. Geo. P. Englehardt visited Washington and took home to Brooklyn a number of the larvæ. He gave me some, which pupated, but failed to emerge. Mr. Englehardt was himself more fortunate, and advises me of the identity of these larvæ, which had remained unknown to me for ten years.

Head rounded, shallowly bilobed, wider than high; light red, the ocelli and mandible-tips black; antennæ whitish, the last joint black-ringed. Abdomen cylindrical, joint 12 slightly enlarged dorsally, tubercles small, normal, iv behind the spiracle at its upper corner. Color, whitish ground, each segment with four transverse blackish bands, the first two separated and partly broken by an orange-red wedge-shaped subdorsal patch; a substigmatal white band, broken into two rounded spots on each segment, anteriorly and posteriorly, so as to tend to form a single enlongated patch intersegmentally, the spots surrounded by the blackish color; subventrally without bands, shaded with reddish, a blackish spot over tubercle vi; leg-shields stained with black about the upper margin and across middle; prothoracic shield weakly chitinized, red, a black bar in front, subdorsally incised, a smaller bar behind, with detached spots on each side; posterior band on joints 3 and 4 broken; anal shield reddish, with the tubercles marked in black.

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NEW MOSQUITOES FROM ALASKA

(Diptera, Culicidæ)

By HARRISON G. DYAR

In June and July, 1921, Dr. J. M. Aldrich of the U. S. National Museum made a trip to Alaska, with the happy result of securing males of two forms of *Aedes*, which had been in the collection many years awaiting names. At the same time, Dr. S. Hadwen of the U. S. Biological Survey was in another part of Alaska and obtained breedings from larvæ of one of these species. We have, therefore, a better idea of the fauna of Alaska north of the coastal islands than was before available.

Aedes punctodes, new species.

Aedes (Ochlerotatus) sp. Dyar, Rept. Can. Arctic Exp., iii, Part C, 33, 1919.

A species of the *punctor* group, as shown by the male hypopygium, but differs in having the claspette-filament long, much as in *dysanor* Dyar, but the basal lobe of side-piece is normal.

It is a black-legged species, the mesonotum dark brown, with two blackish lines, generally narrow and separated, sometimes broad and contiguous. These marks are but little darker than the ground, sometimes obsolescent, and indistinguishable in flown specimens, the mesonotum of which appears uniformly dark brown like *punctor-abserratus* or *intrudens*. The abdomen has broad basal segmental whitish bands, narrowed in the middle, somewhat diffused, especially posteriorly; venter pale gray. Wing-scales all dark, but those on costa, first and third veins are blacker than the others.

Types, eight males, No. 24954, U. S. Nat. Mus.; Anchorage, Alaska (1), June 11, 1921 (J. M. Aldrich); Valdez, Alaska (3), June 8, 1921 (J. M. Aldrich); Unalakleet, Alaska (4), June 3, 6, 7, 9, 1921 (S. Hadwen).

Also females as follows: Anchorage, Alaska, June 10, 16, July 21, 1921 (J. M. Aldrich); Valdez, Alaska, June 8, 1921 (J. M. Aldrich); Unalakleet, Alaska, June 7, 9, 1921 (S. Hadwen); Golovin, Alaska, August 2, 1921 (S. Hadwen); Buckland River, Alaska, August 7, 1921 (S. Hadwen); Kashunuk, Alaska, July 11, 1921 (S. Hadwen); Nome, Alaska, August 21, 24, 25, 1916 (F. Johannsen); Katmai, Alaska, July, 1917 (J. S. Hine); Teller, Alaska, July 29, 1913 (F. Johannsen); Fort St. Michael, Alaska (Army Medical Museum); Iditarod, Alaska, August 29, 1918 (Alice Twitchell); Innoko, Alaska, July 12, 1917 (A. H. Twitchell); Goodnews Bay, Alaska, July 15, 1919 (G. L. Harrington); Koyukuk River, Alaska, summer, 1901 (W. J. Peters); Virgins Bay, Alaska, June 26, 1899 (T. Kincaid); Yakutat, Alaska, June 21, 1899 (T. Kincaid); Hurricane, Alaska, July 15, 1921 (J. M. Aldrich); Healy, Alaska, June 23, 1921 (J. M. Aldrich); Camp 327, Alaska Engineering Commission, Alaska, July 12, 13, 1921 (J. M. Aldrich); Camp 334, Alaska Engineering Commission, Alaska, June 21, July 9, 1921 (J. M. Aldrich); Fairbanks, Alaska, June 29, July 4, 1921 (J. M. Aldrich).

Dr. Hadwen obtained larvæ from pools in the tundra, but unfortunately preserved only immature specimens, so that the characters cannot be given.

***Aedes prolixus*, new species.**

A species of the *lazarensis* group, as shown by the male hypopygium, but differs from both *lazarensis* and *pionips* by having the setæ on the outer lobe of side piece distinctly coarser than the general vestiture. Otherwise as in *lazarensis*.

The mesonotum is covered with light yellowish scales, a dark brown band in the middle, sometimes divided into two approximate bands, running back nearly to antescutellar space, all as in normal *punctor*. The abdominal bands are contracted or

broken in the middle. Wing-scales dark, the costa, first and third veins often appearing darker.

Types, three males, No. 24953, U. S. Nat. Mus.; Anchorage, Alaska (2), June 11, 1921 (J. M. Aldrich); Camp 327, Alaska Engineering Commission, Alaska (1), July 12, 1921 (J. M. Aldrich).

Also females as follows: Anchorage, Alaska, July 21, 1921 (J. M. Aldrich); Hurricane, Alaska, July 15, 1921 (J. M. Aldrich); Popoff Island, Alaska, July 8, 9, 11, 13, 16, 1899 (T. Kincaid).

THE AMERICAN AEDES OF THE IMPIGER (DECTICUS) GROUP

(*Diptera, Culicidae*)

By HARRISON G. DYAR

The species are here considered solely as they occur in North America. It is probable that one or more of them are the same as species occurring in north Europe, and if this is established, it will effect a change in nomenclature, namely, the sinking of *lazarensis* under *communis* DeGeer; but as the American forms will doubtless remain as races, the change will not be radical. The male hypopygium is not clearly diagnostic of species in all cases, and does not define the races at all; much the same condition existing as with the *punctor* group, discussed heretofore (Ins. Ins. Mens., ix, 69-80, 1921). The larvæ are more characteristic, defining the species well. Two series exist, the *lazarensis* series in which the male hypopygium has the apical lobe of the side piece well haired, and the *impiger* series, in which it is nearly bare.

SERIES 1

SPECIES 1

Aedes (*Ochlerotatus*) *prolixus* Dyar.

Aedes prolixus Dyar, Ins. Ins. Mens., x, 2, 1922.

Marked like normal eastern *lazarensis*, except that the bands tend to fuse centrally. The genitalia are distinctive. The

species comes from Alaska, as reported on a previous page, but is a somewhat rare form.

SPECIES 2

Aëdes (Ochlerotatus) pionips Dyar.

Aëdes pionips Dyar, Ins. Ins. Mens., vii, 19, 1919.

Aëdes pionips Dyar, Ins. Ins. Mens., viii, 7, 1920.

Aëdes (Heteronycha) pionips Dyar, Ins. Ins. Mens., viii, 105, 1920.

Aëdes (Heteronycha) pionips Dyar, Trans. Royal Can. Inst., xiii, part 1, 99, 1921.

Besides the Canadian records given in the last citation, the species occurs at Skagway, Alaska, and in the Glacier National Park, Montana. So far it has not been taken in the mountains of New Hampshire or northern New York. It appears to be unrepresented in the Cascades and the Sierra Nevada along the west coast.

SPECIES 3

Aëdes (Ochlerotatus) lazarensis Felt & Young.

Culex lazarensis Felt & Young, Science, n. s., xx, 312, 1904.

Culex lazarensis Felt, Bull. 79, N. Y. Sta. Mus., 309, 1904.

Culicada lazarensis Felt, Bull. 79, N. Y. Sta. Mus., 391b, 1904.

Culicada lazarensis Felt, Bull. 97, N. Y. Sta. Mus., 448, 478, 1905.

Grabhamia lazarensis Dyar, Proc. Ent. Soc. Wash., vii, 48, 1905.

Aëdes lazarensis Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 202, 1906.

Ochlerotatus lazarensis Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. ser. 11, 19, 1906.

Ochlerotatus lazarensis Dyar, U. S. Dept. Agr., Bur. Ent., Circ. 72, 6, 1906.

Culicada lazarensis Theobald, Mon. Culic., iv, 360, 1907.

Culicada lazarensis Theobald, Mon. Culic., v, 295, 306, 1910.

Aëdes lazarensis Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 733, 1917.

Aëdes (Ochlerotatus) lazarensis Dyar, Ins. Ins. Mens., vi, 78, 1918.

Aëdes lazarensis Dyar, Ins. Ins. Mens., vii, 17, 1919.

Aëdes lazarensis Dyar, Ins. Ins. Mens., viii, 5, 1920.

Aëdes (Heteronycha) lazarensis Dyar, Ins. Ins. Mens., viii, 105, 1920.

Aëdes lazarensis Dyar, Ins. Ins. Mens., ix, Plate 1, fig. 1, 1921.

Aëdes (Heteronycha) lazarensis Dyar, Trans. Royal Can. Inst., xiii, part 1, 98, 1921.

This species is characteristic of the Canadian forested region; being on the whole the most abundant form. It is probably not specifically separable from *Aedes communis* DeGeer of northern Europe. In the west a number of local forms may be recognized as subspecies.

***Aedes lazarensis borealis* Ludlow.**

Culex borealis Ludlow, Can. Ent., xliii, 178, 1911.

Aedes borealis Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 1041, 1917.

Aedes lazarensis borealis Dyar, Ins. Ins. Mens., viii, 6, 1920.

Aedes lazarensis borealis Dyar, Ins. Ins. Mens., viii, 165, 1920.

Aedes lazarensis borealis Dyar, Trans. Royal Can. Inst., xiii, part 1, 98, 1921.

Characterized by the extreme variability and the occurrence of specimens with the mesonotum whitish instead of yellow. The normal form also occurs, but rather as an aberration. I observed this subspecies in the Yukon watershed from Carcross to Dawson and at Skagway, Alaska. Dr. Ludlow's types came from Eagle, Alaska, some miles down the Yukon below Dawson.

***Aedes lazarensis altiusculus* Dyar.**

Aedes altiusculus Dyar, Ins. Ins. Mens., v, 100, 1917.

Aedes (Ochlerotatus) altiusculus Dyar, Ins. Ins. Mens., vi, 78, 1918.

Aedes (Heteronycha) altiusculus Dyar, Ins. Ins. Mens., viii, 105, 1920.

Found on the meadows on the lower slopes of Mount Rainier, Washington. It is a diminutive form, flying with the large *Aedes aboriginis* Dyar, a species belonging to the moist coastal fauna, a very peculiar association.

***Aedes lazarensis masamae* Dyar.**

Aedes (Heteronycha) masamae Dyar, Ins. Ins. Mens., viii, 166, 1920.

This form inhabits the slopes of the mountains about Crater Lake, Oregon. These slopes are long and gentle, and in spring the retreating snow forms a definite even line. Visiting this region in May, the snow line was about twenty miles above

Prospect. At Prospect *masamae* was scarce, though a few adults were taken. On reaching snow-line, however, they were abundant, and continued so over the snow up to the summit. People living there called them "snow mosquitoes" and were of the opinion that they bred from the snow banks. Larvæ were found, however, in small pools along the course of a rivulet issuing from the melting snow, a short distance below the snow-fields. The adults evidently follow the snow upward as it melts, at least the great majority of them, remaining at high altitudes after the snow has gone till late in the season. The dampness of the snow-banks may prove attractive to them. I have not observed such a phenomenon elsewhere.

The form *masamæ* is distinguished by the dark brown shade overspreading the mesonotum, although normally colored gray individuals occur.

***Aedes lazarensis tahoënsis* Dyar.**

Aedes tahoënsis Dyar, Ins. Ins. Mens., iv, 82, 1916.

Aedes tahoënsis Dyar, Ins. Ins. Mens., v, 11, 1917.

Aedes tahoënsis Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 1041, 1917.

Aedes (Ochlerotatus) tahoënsis Dyar, Ins. Ins. Mens., vi, 78, 1918.

Aedes (Heteronychia) tahoënsis Dyar, Ins. Ins. Mens., viii, 165, 1920.

This form inhabits the northern Sierras of California. The adults have the mesonotum gray with slight brown suffusion without great variation. The larvæ hatch in large numbers in special large open pools, very early in the season. Tramping over the snow-banks at Summit, California, in April, these pools would be found full of snow and frozen over except at the warmest corner. Here the larvae of *tahoënsis* occurred, well grown, mostly in the last stage, before any of the other species of the region had begun to hatch from the eggs. After the snow is gone, these larvae linger in these large pond-like pools, gradually pupating, drifting about in masses from one side of the pool to another by the wind. These pools occur along the valleys of little streams in their upper reaches, and dry out during the summer.

SERIES 2

SPECIES 4

Aedes (Ochlerotatus) impiger Walker.

Culex impiger Walker, List Dipt. Brit. Mus., i, 6, 1848.

Aedes decticus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 737, 1917.

Aedes lazarensis Dyar (not Felt & Young), Ins. Ins. Mens., vi, 78, 1918.

Aedes decticus Dyar, Ins. Ins. Mens., vii, 21, 1919.

Aedes impiger Dyar, Ins. Ins. Mens., viii, 8, 1920.

Aedes (Heteronycha) impiger Dyar, Ins. Ins. Mens., viii, 105, 1920.

Aedes (Heteronycha) impiger Dyar, Trans. Royal Can. Inst., xiii, part 1, 100, 1921.

This species extends throughout Canada to Alaska and in northern New England, New York, Minnesota and Montana, but is not known in the mountains of the Pacific Coast. The larvae occur in small forest pools, resembling those of *lazarensis* closely. The species is never abundant.

SPECIES 5

Aedes (Ochlerotatus) cataphylla Dyar.

Aedes cataphylla Dyar, Ins. Ins. Mens., iv, 86, 1916.

Aedes cataphylla Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 1041, 1917.

Aedes prodotes Dyar, Ins. Ins. Mens., v, 118, 1917.

Aedes (Ochlerotatus) prodotes Dyar, Ins. Ins. Mens., vi, 78, 1918.

Aedes prodotes Dyar, Ins. Ins. Mens., vii, 22, 1919.

Aedes (Heteronycha) prodotes Dyar, Ins. Ins. Mens., viii, 106, 1920.

Aedes (Heteronycha) cataphylla Dyar, Ins. Ins. Mens., viii, 106, 1920.

Aedes (Heteronycha) cataphylla Dyar, Ins. Ins. Mens., viii, 167, 1920.

Aedes (Heteronycha) prodotes Dyar, Trans. Royal Can. Inst., xiii, part 1, 101, 1921.

Ochlerotatus prodotes Wesenberg-Lund, Mém. l'Acad. Royale d. Sci. et d. Lett. de Danemark, (8), vii, 81, 1921.

Ochlerotatus prodotes Séguy, Bull. du Mus. d'Hist. nat., Paris, xxvi, 411, 1921.

This species was found breeding abundantly in small grassy pools in narrow meadows along the Little Truckee River, California. Also in a large pool of snow-water near Tahoe Tavern on Lake Tahoe, California. The species favors open forest, and occurs from the Rocky Mountains westward to Yukon Territory, and in the high Sierras of California. It has not been found in the Cascades. It is also recorded as occurring in Scandinavia and other parts of northern Europe, but I have not compared specimens. The larva is of the *lazarensis* type, but has two or more detached teeth on the air-tube between the hair-tuft and the apex, which is a unique character. The species often occurs in large numbers, when present at all.

SPECIES 6

***Aedes* (*Ochlerotatus*) *niphadopsis* Dyar & Knab.**

Aedes niphadopsis Dyar & Knab, Ins. Ins. Mens., v, 166, 1918.

Aedes niphadopsis Dyar, Ins. Ins. Mens., viii, 138, 1920.

Aedes (*Heteronychia*) *niphadopsis* Dyar, Ins. Ins. Mens., viii, 105, 1920.

This species is known only from the eastern shore of Great Salt Lake, Utah. The larva resembles that of *impiger* rather than *cataphylla*, though clearly distinct. The adult has the white-marked and barred vestiture of other species inhabiting open desert regions.

NEW AMERICAN MOTHS AND NOTES

(*Lepidoptera*)

By HARRISON G. DYAR

Family LITHOSIIDÆ

***Afrida exegens*, new species.**

Fore wing gray; a broad white band beyond base, the edges irregular; an outer band, consisting of a long costal patch joined to a rounded spot, reduced to a thread, which joins a tornal spot; some black marking at base of costa and in cell, bordering the white basally and distally. Hind wing white,

shaded with gray in two outer wavy lines, discal mark and terminal line. Expanse, 20 mm.

Type, male, No. 24929, U. S. Nat. Mus.; near Mexico City, Mexico, July, 1921 (R. Müller).

Family NOTODONTIDÆ

Cerura presidio, new species.

Silvery white; collar with a black band behind; thorax with two black spots; abdomen banded with black dorsally. Fore wing with many dentate black lines as in *rarata* Walk., *rivera* Schs. and others, from which the present form differs in the discal mark, which is a line surrounded by a circle; inner band filled with dull olive, almost cut into spots by the dentate bordering lines and without ringlet above inner margin. Hind wing with blackish along base of inner margin, two oblique black lines above tornus and black spots in the fringe. Expanse, 44 mm.

Type, male, No. 24930, U. S. Nat. Mus.; Presidio, Mexico, July (R. Müller).

Disphragis averna Barnes & McDunnough.

Heterocampa pulverea averna Barnes & McDunnough, Can. Ent., xlii, 213, 1910.

Heterocampa pulverea averna Barnes & McDunnough, Cont. Nat. Hist. Lep. N. A., I, No. iv, Plate x, fig. 4, 1912.

Disphragis pasathelys Dyar, Ins. Ins. Mens., ix, 141, 1921.

The name *averna*, described as a variety, was overlooked by me in describing *pasathelys* recently.

Family NOCTUIDÆ

Subfamily HADENINÆ

Eriopyga dormitosa, new species.

Dark brown; abdomen with pale rings posteriorly on the segments. Fore wing dark reddish brown; orbicular and reniform distinct, rounded, black filled; lines pale, indistinct, subbasal followed by two black marks; inner irregular, partly black edged on both sides; outer excurved over cell, followed by divided black dots on the veins; a black median shade, obso-

lete above, widened on inner margin; terminal space partly black filled; fringe a little reddish tinged. Hind wing dark fuscous, paler over disk, dark on termen; a faint discal dot; fringe reddish. Expanse, 22 mm.

Type, female, No. 24931, U. S. Nat. Mus.; near Mexico City, Mexico, July, 1921 (R. Müller).

In general similar to *pantostigma* Dyar, but the reniform more curved, less upright, the wing more heavily black spotted between the lines.

Subfamily CUCULLIINÆ

Walterella ocellata Barnes & McDunnough.

Prothrinax ocellata Barnes & McDunnough, Can. Ent., xlii, 246, 1910.

Prothrinax ocellata Barnes & McDunnough, Cont. Nat. Hist. Lep. N. A., I, part iv, Plate ix, fig. 5, 1912.

Walterella eudesmia Dyar, Ins. Ins. Mens., ix, 62, 1921.

Owing to the peculiar family and generic location assigned to *ocellata*, I overlooked the name in describing *eudesmia*.

Subfamily ACRONYCTINÆ

Dipinacia schiniodes Dognin.

Dipinacia schiniodes Dognin, Ann. Soc. Ent. Belg., li, 239, 1907.

Dipinacia schiniodes Hampson, Cat. Lep. Phal. Brit. Mus., ix, 370, 1910.

Chlorothrix zothecaea Dyar, Ins. Ins. Mens., ix, 64, 1921.

The emargination at tip of the frontal plate in my specimen is so small that I did not consider it present. Hampson's figure may be a little exaggerated; but a specimen received from Mr. Paul Dognin shows that there is no generic separation. I am not quite certain that my species *zothecaea* is the same as *schiniodes* Dognin; but it is at least close.

Agriopodes jucundella, new species.

Head and thorax green, a black line in the neck; abdomen gray, with black basal tuft, darker in the middle, and the anal tuft slightly ocherous. Fore wing light green, a triangular black spot at base of costa at apex and at tornus; a few small black specks along costa and in fringe at middle of outer

margin; some irregular narrow white marks, representing sub-basal, inner, outer and subterminal lines, nearly straight, except the inner, which is angled, and obsolete above. Hind wing pale gray, darker at margin; fringe whitish. Expanse, 15 mm.

Type, male, No. 24932, U. S. Nat. Mus.; Yanco, Porto Rico, September 8, 1921 (F. Sein, communicated by G. N. Wolcott).

Mr. Wolcott states that the larvae feed on lichens, being of the same color as the lichen, marked with brown, a beautiful example of protective resemblance.

***Polionycta apicata* Hampson.**

Polionycta apicata Hampson, Cat. Lep. Phal. Brit. Mus., viii, 41, 1909.

Cropia dimorpha Dyar, Proc. U. S. Nat. Mus., xlvii, 176, 1914.

***Metaxyllia metallicella*, new genus and species.**

Fore wing with areole; fore tibiae and tarsi without claws; frons with rounded prominence; abdomen with dorsal crests on basal segments; proboscis well developed; metathorax with divided crest.

Black; fore wing with a white area beyond outer line, widening to tornus, in which are relieved three round black spots; ordinary lines obscure, subbasal, inner and outer black, wavy, the latter excurved over cell; stigmata black, with metallic blue shadings in median space; subterminal line leaden, waved; fringe long, with obscure black spots. Hind wing dull black. Expanse, 18-20 mm.

Types, two males, No. 24933, U. S. Nat. Mus.; Cuernavaca, Mexico (gift of W. D. Kearfott); near Mexico City, Mexico, July, 1921 (R. Müller).

***Pseudacontia cephalica* Smith.**

Stylopoda cephalica Smith, Trans. Am. Ent. Soc., xviii, 131, 1891.

Pseudacontia modestella Barnes & McDunnough, Cont. Nat. Hist. Lep. N. A., iv, 110, 1918.

Subfamily NOCTUINÆ

***Focilla planitis*, new species.**

Dark brown, the fore wing with a large brown triangular

mark on costa before apex; wing shaded with dark brown, leaving the terminal space broadly paler; lines fine, dark indistinct, the outer dentate and excurved over cell; stigmata narrow, dark, with dark patches between and beyond, more distinct than the stigmata. Hind wing with median dentate brown line and outer pale one, edged with dark. Expanse, 22 mm.

Type, female, No. 24934, U. S. Nat. Mus.; Misantla, Mexico, August, 1921 (R. Müller).

Subfamily HYPENINÆ

Poenopsis abstrusa, new genus and species.

Fore wing with single areole; veins 8, 9, 10 stalked from it; palpi porrect; differs from *Lutogonia* Schaus in the venation of hind wings, the latter having vein 2 from the middle of the cell. In the present form vein 2 arises close to 3 from an angle of the cell before the middle; the vein curves, giving rise to 4, then a second curve and 5 at the normal cell angle.

Fore wing wood-brown; a black tuft on median vein at origin of vein 2; a white discal spot with a black point before it; outer line black, of separated cusps on the veins; a broad faint blackish shade beyond; a terminal row of black dots. Hind wing with down turned brown hair above cell; disk pale, apex and tornus blackish, median margin brown; terminal black dots; fringe reddish brown. Below fore wing with rough yellow scales over cell and below; hind wing with similar scales along vein 1. Expanse, 27 mm.

Type, male, No. 24935, U. S. Nat. Mus.; Guerrero, Mexico, August (R. Müller).

Family GEOMETRIDÆ

Subfamily GEOMETRINÆ

Sicya macularia cruzensis, new subspecies.

Much as in *S. macularia crocearia* Pack., the lines on fore wing of male being straight and upright. Female with the fore wing clear yellow, the red-brown patch on tornus sharply cut; traces of purple spots for the inner and outer lines.

Types, male and female, No. 24936, U. S. Nat. Mus.; Santa Cruz Mts., California (A. Koebele).

***Sicya macularia mexicana*, new subspecies.**

Only the female is before me. Fore wing yellow, with many small purplish patches; inner line indicated by a spot on inner margin; a minute black discal dot; outer margin reddish purple up to vein 5, the outer line indicated by purplish dots. Hind wing pale yellow, a margin broadly light red to vein 6, edged with purplish within; a little purplish at anal angle; a small discal dot.

Type, female, No. 24937, U. S. Nat. Mus.; Mirador, Mexico, April, 1921 (R. Müller).

***Sicya calurodon*, new species.**

Dark straw-yellow; fore wing with the inner line grayish, straight; outer grayish below, running far out, bent to costa, where are two white dots in a purple area; a small red-brown discal dot; anal area broadly grayish shaded, strigose. Hind wing scarcely lighter, with purple marking at anal angle. Female without the lines and many purple patches over the wing.

Types, male and female, No. 24938, U. S. Nat. Mus.; Cuernavaca, Mexico, female, May, 1914, male without data (R. Müller).

Resembles *S. directaria* Guen., less yellow and the outer line much more excurved above.

***Oenotrus opulentissima*, new species.**

Fore wing crimson with rather narrow terminal black border, containing a red streak in the apex. Hind wing black, with crimson streaks from base in discal and submedian folds. Below the fore wing has a pale cream colored costal edge, and the streak across the apex is cream colored and broader. Hind wing with the veins bordered with crimson, being themselves whitish lined, subcostal vein without crimson edge. Expanse, 28 mm.

Type, female, No. 24939, U. S. Nat. Mus.; near Mexico City, Mexico, June, 1921 (R. Müller).

Nearest *O. dispar* Walk., but differing by the crimson streaks on hind wing above and below.

Oenotrus orbifer, new species.

Black, neck and streaks on patagia orange. Fore wing black, with a large round pale yellow spot just beyond cell. Beneath the marking is repeated, the veins beyond it white lined. Hind wing with the veins white lined. Expanse, 26 mm.

Type, male, No. 24940, U. S. Nat. Mus.; Guadalcazar, San Luis Potosi, Mexico, June, 1921 (R. Müller).

Sericosema viridirufaria Neumoegen.

Aspilates viridirufaria Neumoegen, Papilio, i, 145, 1881.

Sicya (?) *hepburni* Druce, Biol. Cent.-Am., Lep. Het., ii, 529, Pl. 98, fig. 12, 1898.

Subfamily HEMITHEINÆ

Racheospila tarachodes, new species.

Pale green, densely irrorate with white; costal edge white; outer line white, slender obscure above; a black discal speck. Hind wing median white line curving around cell, then absent on inner margin; fringes white. Front red above, white below; vertex white. Expanse, 26 mm.

Type, male, No. 24941, U. S. Nat. Mus.; near Mexico City, Mexico, June, 1921 (R. Müller).

Family PYRALIDÆ

Subfamily PYRAUSTINÆ

Cereophagus futilalis, new genus and species.

Palpi porrect, obliquely ascending, the third joint depressed; scaly, the third joint naked and smooth. Maxillary palpi slightly dilated with scales. Fore wing with veins 4-5 from the angle of the cell, 6-7 stalked, 8-9 long-stalked, 10 and 11 on the cell. Hind wing with 4-5 short-stalked, 6 from upper angle of cell, 7-8 anastomosing.

Fore wing light gray, coarsely irrorate with blackish; traces of pale inner and outer lines, which disappear under a lens. Hind wing light gray, sordid whitish at the base. Expanse, 13 mm.

Type, female, No. 24976, U. S. Nat. Mus.; La Rioja, Argen-

tina, February 16, 1921, bred from larvae in stem of *Cerus validus* (W. B. Alexander).

Mimorista pulchellalis, new species.

Yellow, the thorax before and abdomen shaded with brown. Fore wing yellow at base, limited outwardly by a very oblique brown line, from inner margin at basal third to costa at outer line; a small brown patch at base, running outwardly along costa; reniform large, brown, obliquely bisected by the mesial line; inner line faintly indicated on costa, outer traversing the brown outer area, punctiform, with a sinus below vein 2; fringe brown at base, dark brown outwardly. Hind wing suffused with brown, irrorate with dark brown centrally, yellowish at extreme base. Expanse, 20 mm.

Type, male, No. 24977, U. S. Nat. Mus.; Catamarca, Argentina, March 5, 1921, from larvae feeding in *T. huascha*? (W. B. Alexander).

Sufetula philogelos, new species.

Fore wing dark gray, powdery, the lines black, narrowly whitish edged; inner straight, outer strongly outcurved, retracted at vein 2 in a deep sinus, a tooth on vein 1. Hind wing with a similar median line, less strongly angled. Marginal excavation of both wings very slight. Expanse, 10 mm.

Types, three males and one female, No. 24943, U. S. Nat. Mus.; male and female, Miami, Florida (Schaus collection); two males, Mirador, Mexico, June, 1921 (R. Müller).

On the strength of these specimens, *S. diminutalis* Walk. (*dematralis* Druce) has been listed from Florida; but the present form bears no resemblance to *diminutalis*.

Subfamily NYMPHULINÆ

Stenia astenialis, new species.

Sordid straw-yellow, thinly scaled, the veins, costa and outer margin more thickly so; faint inner and outer lines, the inner curved, the outer excurved over cell. Hind wing pale, like the fore wing interspaces, a dark line in base of fringe of both

wings. Margins shallowly excavate subapically, the wings rather broad. Expanse, 25-26 mm.

Types, four males and two females, No. 24942, U. S. Nat. Mus.; Mexico City, Mexico, August, 1921 (R. Müller).

Subfamily CRAMBINÆ

Platytes circumvagans, new species.

Fore wing white, longitudinally shaded with blackish on costa, in discal fold beyond cell and along submedian fold; a median shaded line, running out elliptically around cell, inwardly oblique below to inner margin; a zig-zag subterminal line, the longest tooth at vein 1; terminal and discal dots black. Hind wing white. Expanse, 20 mm.

Type, female, No. 24944, U. S. Nat. Mus.; Mirador, Mexico, June, 1921 (R. Müller).

Subfamily PHYCITINÆ

✓ **Diroyctria stenopteryx**, new species.

Fore wing long and narrow, gray; marked by many black spots; two spots at base; two beyond, with subcostal streaks; inner line indicated below median vein, preceded by two spots and followed above by subcostal streaks; an oblique row of spots and venular streaks to discal spot, which is single (lower); a faint pale subterminal line, cutting the black veins into paired spots; terminal dots nearly conjoined. Hind wing hyaline, pellucid, gray narrowly on costa and double terminal line. Expanse, 27 mm.

Types, four males, No. 24945, U. S. Nat. Mus.; Tehuacan, Mexico, July, 1913 (R. Müller).

Cactoblastis bucyrus, new species.

Dark gray, almost blackish, especially on inner half of wing. Lines whitish, indistinct, the inner angled on submedian, the outer dentate-crenulate; discal mark large, rounded, clouded-black. Hind wing dark gray in both sexes. Expanse, male, 30 mm.; female, 39 mm.

Types, male and two females, No. 24978, U. S. Nat. Mus.; Mendoza, Argentina, January 26, 1921, from larvae feeding

in *Echinocactus?* (♂, ♀); Andalgala, Argentina, March 28, 1921, from larvae in *Echinopsis* (♀) (W. B. Alexander).

Larger and darker than *C. cactorum* Berg, which Mr. Alexander has bred from *Opuntia*.

✓ ***Zophodia analamprella*, new species.**

Fore wing dark stone-gray, the costa broadly white, diminishing at base, and terminating before apex, where the white is a little streaked with gray; no lines. Hind wing translucent, slightly sordid and yellowish; apex and terminal line gray. Expanse, 25-27 mm.

Types, two males and two females, No. 24979, U. S. Nat. Mus.; Carmen Patagones, Argentina, January 29-31, 1921, from larvae feeding in *Opuntia sulphurea* (2♂, ♀); Andalgala, Argentina, March 26, 1921, from larva in joint of *O. sulphurea* (♀) (W. B. Alexander).

The palpi in both sexes are long, beak-like, porrect and down-curved.

✓ ***Zophodia stigmaferella*, new species.**

Fore wing gray, the costal half lightened by white, but overlaid with irrorations so as not to form a stripe; inner line straight, indented on submedian, followed by a broad black shade, which is distinct on the costal half against the white ground; outer line double, black, denticulate; discal mark single, black; a row of terminal black dots. Hind wing translucent whitish, shining, apex and terminal line dark gray, as costa and terminal streaks on the veins. Expanse, 26 mm.

Type, female, No. 24980, U. S. Nat. Mus.; Catamarca, Argentina, March 7, 1921, from larva in stem of *Cerus validus* (W. B. Alexander).

The palpi of the female are slender, upturned, the second joint thickened with scales below, the third terete and as long as the second. This does not agree with my conception of *Zophodia*; but as the palpi of *Z. goyensis* Rag. are similar, and the male is not at hand, the present position is assigned.

✓ ***Ozamia hemilutella*, new species.**

Fore wing gray, the area below median vein and vein 2 light

yellowish, without marks; a broad blackish shade at middle of wing from costa to yellowish area; discal dots conjoined, dark, in a diffused darker area; outer line near margin, double, blackish, the inner line crenulate, the outer straight and diffused. Hind wing subhyaline whitish, with gray costa and terminal line. Expanse, 29 mm.

Types, male and female, No. 24981, U. S. Nat. Mus.; La Rioja, Argentina, February 16 and March 25, 1921, from larvae in flower and stem of *Cerus validus* (W. B. Alexander).

Family NOLIDÆ

Roeselia caruscula, new species.

Fore wing white, with a raised triangular gray tuft at middle of costa, edged with black within; from this a wavy black median line crosses the wing; inner line invisible, outer curved over cell, punctiform; subterminal line shaded, gray, wavy. Hind wing with gray discal dot, the termen a little dusky. Expanse, 12 mm.

Type, female, No. 24946, U. S. Nat. Mus.; Mirador, Mexico, June, 1921 (R. Müller).

Near *R. patina* Druce, smaller, the lines paler, the hind wing without gray shading.

NOTE ON THE MALE GENITALIA OF CULEX CORONATOR AND ALLIED FORMS

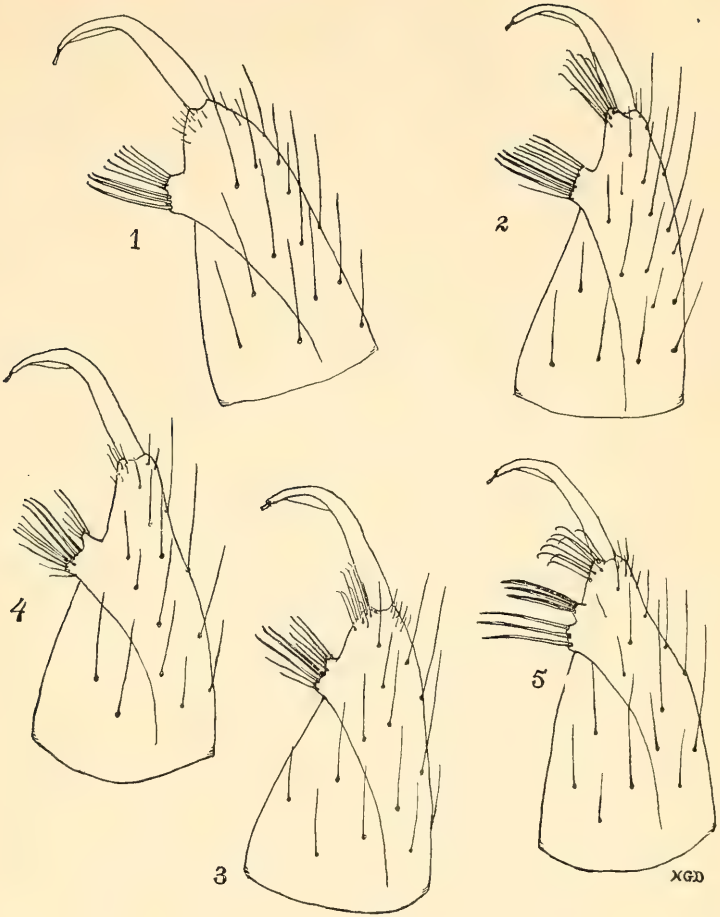
(*Diptera, Culicidæ*)

By HARRISON G. DYAR

In the forms here noticed, the mesosomal structures of the male genitalia are identical. Variation occurs in the setæ of the lobe of the side-piece and the apex.

Culex coronator Dyar & Knab.

The structure of the side-piece is shown in Plate I, figure 1. The three normal rods are present, but the outer part bears no leaf, is slightly detached and carries about six setæ.



MALE GENITALIA OF CULEX CORONATOR AND VARIETIES

1. *Culex coronator* Dyar & Knab, Peralta, Costa Rica.
2. *Culex usquatus* Dyar, Surinam.
3. Transitional from *usquatus* to *ousqua*, Venezuela.
4. *Culex ousqua* Dyar, Canal Zone, Panama.
5. *Culex usquatissimus* Dyar, Canal Zone, Panama.

Culex usquatus Dyar.

Shown in figure 2. I have referred this as a variety of *coronator*, but it would seem rather to run into *ousqua*, judging by the transitional specimen from Venezuela, figured in figure 3.

Culex ousqua Dyar.

Shown in figure 4. The multiplication of hairs on the basal side of the rods is intensified, while the outer part of the lobe is reduced and constricted. The setæ at apex of lobe are short again as in *coronator*, being long in *usquatus* and intermediate in the transitional form.

Culex usquatissimus, new form.

Shown in figure 5. The apical hairs are long; rods of the lobe without accompanying hairs, the outer group reduced to three heavy blackish blade-shaped structures. The adults have the white markings reduced, tarsi with only very narrow white rings, though the male retains the small white band on the proboscis.

Types, male and female, No. 25147, U. S. Nat. Mus.; Toro Point, Canal Zone, Panama, October 27, 1921 (J. B. Shropshire).

**AN UNDESCRIBED SPECIES OF DIXA FROM
NEW ZEALAND**

(*Diptera, Dixidæ*)

BY CHARLES P. ALEXANDER

The family Dixidæ includes the single genus *Dixa* Meigen. Many students of the Culicidæ place these flies in this family as the subfamily Dixinæ. The writer is not entirely convinced that *Dixa* is not deserving of full family rank and it is so considered in the present paper. Up to date, 36 species of these flies have been described, distributed in the following regions: Palæarctic, 20 species, including 3 described within the past year by Edwards and Séguy; Nearctic, 7 species; Neotropical,

3 species, one of which is also recorded from the Nearctic, perhaps erroneously; Oriental, 6 species, described by Brunetti and Edwards. No species had been recorded from the Ethiopian or Australasian regions. It was with great interest, therefore, that the writer received specimens of a very interesting *Dixa* from New Zealand. This new species is dedicated to the collector, Dr. J. W. Campbell, to whom I am indebted for many kindnesses in the past. The alcoholic types are in the writer's collection; paratypes will be sent to the Canterbury Museum.

***Dixa campbelli*, new species.**

General coloration yellow, handsomely marked with dark brown; legs yellow, tips of the femora and tibiæ darkened; tips of posterior tibiæ enlarged; wings faintly grayish; a conspicuous dark brown blotch at *r-m* and another on vein *M*; *r-m* connecting with *Rs* before its fork.

Male.—Length 2.8–3 mm.; wing 3.3–3.5 mm.

Described from alcoholic material.

Rostrum brown above, paler laterally and beneath; palpi pale brown. Antennæ with the enlarged scapal segments dark brown, the flagellum a little paler, especially the basal segment. Head dark brown, paler beneath and on genæ.

Pronotum obscure yellow, dark brown medially. Mesonotum yellow, handsomely marked with dark brown; a broad, conspicuous stripe on either side; a narrower median stripe, broad in front and here indistinctly split by a pale vitta, narrowed behind (in some cases this abrupt narrowed portion subobsolete), extending to the scutal region where it covers the caudal margin of the sclerite; scutellum light yellow, indistinctly margined with darker; postnotum dark brown. Pleura yellow, conspicuously striped and blotched with dark brown; mesosternum broadly dark brown, pale ventro-medially, more broadly so on prosternum; a conspicuous, longitudinal pleural stripe extending from behind the fore coxæ to the mesepimeron which is largely suffused; the ventral yellow stripe formed between this stripe and the mesosternum is narrower than the

brown stripe; two brown blotches on the dorsal portions of the mesepisternum; propleura dark. Halteres pale, the knobs light yellow. Legs with the coxæ yellow, the fore coxæ infuscated; trochanters pale; femora yellow, the tips conspicuously dark brown; tibiæ light brown, the tips conspicuously blackened; posterior tibiæ swollen at tips and more extensively blackened; tarsi brown. Wings with a faint grayish tinge, the extreme base more yellowish; a large, dark brown blotch at *r-m*, suffusing the adjoining veins of the cord, interrupted at *m-cu*; a smaller brown blotch beyond midlength of *M*; veins narrowly and somewhat indistinctly seamed with dark brown, more heavily along R_4+5 ; anal angle faintly clouded; veins dark brown. Venation: Sc_1 ending a short distance before the origin of *Rs*, Sc_2 far from its tip, Sc_1 alone nearly equal to the first section of *Rs*; basal section of *Rs* long, straight; *r-m* connecting with *Rs* far before its fork, the second section of *Rs* being longer than *r-m*; R_2+3 gently arcuated; forks of *M* widely divergent; *m-cu* about equal to *r-m*.

Abdomen brown, darker apically; basal sternites and lateral portions of the basal tergites obscure yellow.

Habitat.—New Zealand (South Island).

Holotype, male, Charteris Bay, Banks Peninsula, Canterbury, September 4, 1921 (J. W. Campbell).

Paratopotypes, 6 males.

The specimens were in small swarms over a stream.

AN UNDESCRIBED NET-WINGED MIDGE FROM JAPAN

(*Diptera*, *Blepharoceridæ*)

BY CHARLES P. ALEXANDER

There has been but a single species of net-winged midge described from the Japanese Empire. It was with great interest, therefore, that the writer discovered a second species in a collection of Tipuloidea sent to the writer for determination by Dr. T. Shiraki, Chief Entomologist of Formosa. The writer is indebted to Dr. Shiraki for the privilege of studying this fly,

the type of which has been returned to the Agricultural Experiment Station at Taihoku.

***Blepharocera shirakii*, new species.**

General coloration black, the mouthparts and base of antenna pale; wings subhyaline, iridescent; veins dark brown.

Male.—Length, 6.2 mm.; wing, 7.8 mm.

Mouthparts reddish; palpi pale brown. Antennæ with the scape and base of the first flagellar segment nearly glabrous, obscure yellow; remainder of the flagellum dark brown, densely pubescent. Head black, the ocelli conspicuously light yellow; eyes hairy.

Mesonotum dull black without distinct pale markings other than a faint reddish tinge between the usual median and lateral praescutal stripes. Pleura dark, obscure yellow beneath the wing-root. Halteres yellow, the knobs brown. Legs with the fore coxæ dark, the remaining coxæ obscure yellow; trochanters yellow; remainder of the legs brown, the femoral bases obscure yellow. Wings subhyaline, iridescent; veins dark brown. Venation as in the genus; a small chitinized knot in the anal angle of the wing.

Abdominal tergites dark brownish black, the sternites much paler, especially at the base of each segment. Hypopygium black.

Habitat.—Japan (Honshu).

Holotype, male, Tokumoto, Province of Shinano, July 12, 1918 (T. Shiraki).

This interesting net-winged midge is named in honor of the collector, Dr. T. Shiraki, to whom I am indebted for many favors.

Blepharocera shirakii is the second species of net-winged midge to be described from Japan. The *Liponeura infuscata* Matsumura (Thousand Insects of Japan, Additamenta 2, pp. 443, 444, Pl. 24, fig. 7, 1916) is a very different species whose true generic position is very doubtful. The only regional *Blepharocera* is *B. indica* Brunetti (Records Indian Museum, vol. 4, p. 316, 1911) from the Simla district of Northern India.

From Brunetti's description and figure it appears almost certain that his fly is a *Philorus* rather than a *Blepharocera*. His statement (Fauna of British India, Diptera Nematocera, p. 156, 1912), "*The 4th, 5th, and 6th veins spring almost simultaneously from a common stem quite near the base of the wing,*" can mean nothing else than that the basal section of M_3 is preserved, this being the generic character of *Philorus* Kellogg. The rather indifferent figure supplied by Brunetti in the last reference mentioned would bear this out. The species *Philorus bionis* Agharkar (Records Indian Museum, vol. 10, p. 160, 1914) is specifically distinct from *P. indica*.

NEW SPECIES OF LITHOSIIDAE FROM THE ORIENTAL REGION

(*Lepidoptera*)

BY W. SCHAUS

***Tigrioides soror*, new species.**

Female.—Palpi black fringed below with whitish buff. Head pale yellow. Collar and thorax light buff; black points on front of patagia. Abdomen capucine orange; a whitish gray patch dorsally at base; a sublateral series of black spots. Legs pale buff at base, the tibiæ almost entirely and tarsi black. Fore wings light buff with faint darker streaks along median and submedian fold; two postmedial black spots above and below submedian vein. Hind wings pale maize yellow, the termen narrowly and cilia darker. Wings below maize yellow, the termen of fore wing narrowly fuscous, the costa of hind wing narrowly orange yellow.

Expanse, 48 mm.

Habitat.—Mt. Salak, Java.

Type.—Cat. No. 25154, U. S. Nat. Mus.

Collected by Bryant and Palmer.

Nearest *T. puncticollis* Butler.

***Tigrioides luzonensis*, new species.**

Female.—Palpi avellaneous above, buff yellow below. Head

buff yellow. Collar and thorax avellaneous, the shoulders and outer edge of collar buff yellow. Abdomen silky gray on dorsum, the two last segments, sides, and venter orange buff. Fore wings avellaneous, the costal margin buff yellow, extending into cell, and narrowing towards apex. Hind wings thinly scaled light buff. Fore wings below with the costa darker buff yellow, this tint extending along termen.

Expanse, 20 mm.

Habitat.—Los Baños, Philippine Islands.

Type.—Cat. No. 25155, U. S. Nat. Mus.

Collected by F. C. Baker.

Near *T. aurantiaca* Hampson.

Tigrioides pallidicosta, new species.

Female.—Head and thorax fuscous. Abdomen above dark mouse gray. Body below and legs white; fore tibiae and tarsi streaked with drab. Fore wings drab, darkest on basal half, terminally paler with darker streaks on veins; costal margin white, expanding toward apex extending to vein 6; inner margin on terminal third whitish; cilia white. Hind wings mouse gray, the cilia tipped with white. Wings below mouse gray, the hind wings faintly tinged with blue, the fore wings with costa narrowly and cilia bone white.

Expanse, 25 mm.

Type.—Cat. No. 25156, U. S. Nat. Mus.

Collected by Bryant and Palmer.

Near to *T. griseescens* Beth-Baker.

Bryantia, new genus.

Male.—Proboscis fully developed; palpi porrect twice the length of head; antennae pubescent with long cilia; legs long, slender, with two pairs of spurs on hind tibiae. Fore wings rather long, narrow, the costa arched towards apex, the outer margin rounded; vein 2 from middle of cell shortly downbent then downcurved, the median beyond it upbent so the cell becomes very narrow; 3 and 4 on downbent stalk; 5 absent; 6 and 7 from cell; 8, 9, 10 stalked; 11 free; a ridge of down-turned hairs at middle of costa above; some thick scaling be-

yond cell below. Hind wings with vein 2 from before middle of cell; 3 and 4 stalked; 5 absent; 6 and 7 stalked.

Type of genus.—*Bryantia caudata*, new species.

Near *Ctenosia* Hampson.

***Bryantia caudata*, new species.**

Male.—Palpi fuscous. Head, thorax and base of abdomen brownish gray; abdomen otherwise with long orange buff hairs, the lateral hairs extending well beyond anal tufts, and spreading out. Fore wings brownish gray; an oblique black line above lower radial; a fine fuscous, dentate, postmedial line outcurved beyond cell, obliquely downbent below vein 3. Hind wings whitish buff, the termen brownish gray widest at apex.

Expanse, 27 mm.

Habitat.—Pelaboean, Java.

Type.—Cat. No. 25157, U. S. Nat. Mus.

Collected by Bryant and Palmer.

***Ilema tjibodas*, new species.**

Male.—Head, collar, and thorax wood brown. Abdomen fuscous, the base dorsally whitish gray followed by long ochreous hairs. Fore wings pale ochraceous buff, irrorated with reddish brown; fringe of scales in cell white, also costa to near middle, with an antemedial black streak, continuing as a fine line along edge to base; a brown subbasal shade on inner margin; from cell below antemedial streak, there is an oblique dark shade or line to near outer line at submedian, when it is downbent; outer line from middle of costa outbent along costal margin, curved subterminally and parallel with termen, fuscous and consisting partly of streaks; termen darker shaded. Hind wings whitish basally, suffused with smoky gray from middle of costa to termen, below vein 6 more narrowly so to anal angle. Fore wings below drab, the inner margin white. Hind wings below with the terminal area darker than above.

Expanse, 26 mm.

Habitat.—Tjibodas, Mt. Gedeh, Java.

Type.—Cat. No. 25158, U. S. Nat. Mus.

Collected by Bryant and Palmer.

Structurally near *Ilema plagiata* Walker.

***Ilema aberrans*, new species.**

Male.—Head, collar, thorax and fore wings chamois. Abdomen whitish buff, at base dorsally white, the anal tufts mixed with yellow hairs. Hind wings warm buff, the inner margin broadly white. Fore wings below paler, hind wings below whiter.

Expanse, 19 mm.

Habitat.—Los Baños, Philippine Islands.

Type.—Cat. No. 25159, U. S. Nat. Mus.

Collected by C. F. Baker.

Neuration as in *Ilema decreta* Butler, and is probably a local race of that species.

***Chrysaeglia javana*, new species.**

Male.—Palpi white streaked above with black. Head, collar, patagia and abdomen white, the thorax pale ochreous buff; a transverse black line on frons. Legs pale pinkish drab; tarsi above fuscous with white cross lines at segments; fore tibiae fuscous. Wings white, the fore wings with apical third of costa finely black.

Expanse, 47 mm.

Habitat.—Bantas Gebang, Java.

Type.—Cat. No. 25160, U. S. Nat. Mus.

A female has the tips of cilia below apex of fore wing black.

Collected by Bryant and Palmer.

***Agylla robinsoni*, new species.**

Male.—Palpi and head black. Collar orange. Thorax silky drab. Abdomen orange yellow. Legs orange yellow, fore tarsi black. Fore wings silky drab; an orange yellow streak on costal margin for two-thirds from base; the costal edge on basal half black. Hind wings light orange yellow, the costal margin tinged with pale drab. Fore wings below with the orange yellow streak reaching apex, the inner margin whitish gray. Hind wings below with the costal margin fuscous drab.

Expanse, 36 mm.

Habitat.—Baguio, Philippine Islands.

Type.—Cat. No. 25161, U. S. Nat. Mus.

Collected by W. Robinson.

This species belongs to Hampson's Sect. I with pectinated antennae.

***Agylla palmeri*, new species.**

Male.—Palpi drab. Head black, collar buff yellow. Thorax chaetura drab, the outer edge of patagia white. Abdomen above fuscous, anus and underside pale orange yellow. Legs mostly pale drab, the fore tibiae and tarsi fuscous black. Fore wings silvery white; costa finely pale yellow; a dark mouse gray oblique fascia from base of costa across cell and along vein 2, not reaching termen. Hind wings cartridge buff. Fore wings below maize yellow, inner margin white, terminal area beyond cell silky fuscous.

Expanse, 31 mm.

Habitat.—Mount Gedeh, Java.

Type.—Cat. No. 25162, U. S. Nat. Mus.

Female differs from the male in having the inner margin from near base broadly dark mouse gray instead of oblique fascia.

Expanse, 39 mm.

There are four males and two females in the collection, all from the same locality, collected by Bryant and Palmer.

Nearest *A. divisa* Walker.

***Siopastea*, new genus.**

Female.—Proboscis fully developed; palpi upturned, slender, reaching vertex of head; antennae with minute bristles; hind tibiae with two pairs of spurs. Fore wing fairly broad, the costa convex towards apex; vein 2 from near end of cell; 3 from lower angle; 4 and 5 stalked; 6 from below upper angle; 7, 8, 9 stalked, 7 from beyond 9; 10 and 11 free. Hind wings: Veins 2, 3, 4 from cell; 5 absent; 6 and 7 stalked; 8 from before middle of cell.

Type.—*Siopastea bakeri*, new species.

Near *Pasteosia* Hampson and *Areva* Walker.

Siopastea bakeri, new species.

Female.—Palpi and frons grayish. Vertex, collar, thorax and fore wings light orange yellow. Abdomen grayish white, the anal hairs ochreous. Legs buff white, tarsi fuscous. Hind wings yellowish white. Fore wings below pale orange yellow, the disc faintly shaded with fuscous. Hind wings below as above.

Expanse, 18 mm.

Habitat.—Los Baños, Philippine Islands.

Type.—Cat. No. 25163, U. S. Nat. Mus.

Collected by C. F. Baker.

Manoba semigrisea, new species.

Female.—Palpi drab, the third joint black. Head, collar and thorax drab. Abdomen silvery drab gray. Fore wings white on basal third, limited by an oblique fuscous brown shade becoming paler outwardly, suffusing gradually with the grayish white terminal area; antemedial black points below cell and above submedian; a black point at end of cell; a postmedial outcurved series of black points from vein 8 to inner margin; terminal black points almost suffusing. Hind wings mouse gray. Fore wings below silvery mouse gray. Hind wings below grayish white.

Expanse, 11 mm.

Habitat.—Los Baños, Philippine Islands.

Type.—Cat. No. 25164, U. S. Nat. Mus.

Collected by C. F. Baker.

Near *M. rectilinea* Snell.

Manoba punctillata, new species.

Male.—Palpi ochreous. Head, collar and thorax white. Abdomen whitish ochre. Fore wings creamy white shading to pure white on termen; an antemedial black point on submedian; a black point at end of cell. Hind wings ochraceous white. Fore wings below gray, the termen shaded with white, the base of inner margin with ochraceous white. Hind wings below white, the costa pale ochreous.

Expanse, 9 mm.

Habitat.—Los Baños, Philippine Islands.

Type.—Cat. No. 25165, U. S. Nat. Mus.

Collected by C. F. Baker.

Chionaema saidova, new species.

Male.—Palpi ochreous tipped with white. Head white, collar white fringed with fuscous brown. Thorax white with brownish spots on patagia. Abdomen fuscous brown. Thorax and abdomen below white. Fore wings white; a black basal spot; a black subbasal line indentate at subcostal vein, sinuous below cell, not reaching inner margin; antemedial space with a large cluster of black scales in and below cell to submedian fold; medial space broadly yellow ochre with a white space on costa and in cell, containing in cell three black annuli, the proximal two contiguous; terminal space with a cluster of black scales beyond cell, suffusing with a terminal reddish brown line, this latter not reaching apex; some black irrorationes forming a faint subterminal line. Hind wings fuscous brown. Wings below fuscous brown, the costa of fore wing yellow ochre, the apex narrowly whitish.

Expanse, 22 mm.

Habitat.—Khow Sai Dow Mountains, Lower Siam.

Type.—Cat. No. 25166, U. S. Nat. Mus.

Collected by Dr. W. L. Abbott.

Near *C. gelida* Walker.

Eurosia lactanea, new species.

Male.—Body white. Fore wings creamy white; some antemedial fawn color scales on inner margin; termen fawn color, widest at apex, narrowing to a point above submedian; cilia white. Hind wings white. Fore wings below with the costal margin broadly shaded with pale fawn color.

Expanse, 9 mm.

Habitat.—Mt. Makiling, Luzon, Philippine Islands.

Type.—Cat. No. 25167, U. S. Nat. Mus.

Collected by C. F. Baker.

***Idopterum admirabilis*, new species.**

Male.—Head, collar and thorax buff yellow; a black point on vertex; black streaks on shoulders; black points on patagia; abdomen ochraceous white; legs ochraceous yellow with black streaks on mid tibiae and base of fore tarsi. Fore wings maize yellow; a black line on base of costa; a subbasal black point in cell; an antemedial black line inbent and straight to inner margin; a black line from antemedial in cell outbent to inner margin close to postmedial, preceded below cell by a triangular eosine pink spot; a black point at end of cell; postmedial line inbent on costa to above discocellular spot, then deeply outbent along vein 6 and wavy to inner margin followed from costa to vein 6 and preceded below vein 6 by a broad eosine pink band; a subterminal small black spot at vein 8; marginal black spots at veins 4 and 6; a fuscous terminal line at apex. Hind wings white with a narrow terminal fuscous shade. Wings below whitish, the fore wings with a pinkish tinge in disc, and the lines less distinct.

Expanse, 15 mm.

Habitat.—Mt. Salak, Java.

Type.—Cat. No. 25168, U. S. Nat. Mus.

Collected by Bryant and Palmer.

Differs from typical *Idopterum* in having the fore wing broader, the outer margin not rounded. The abdomen of the female is not dilated terminally.

***Asura semiorbis*, new species.**

Male.—Head, collar, thorax and fore wings maize yellow; fuscous points on thorax and patagia. Abdomen ochraceous yellow; black streaks on fore tibiae and base of tarsi. Fore wings with the markings fuscous mingled with yellowish scales; basal third of costa edged with a black line; a subbasal point in cell and a streak on submedian fold; antemedial line fine, deeply inangled on subcostal, then evenly excurved to near base of inner margin; a medial line outangled on costa then slightly incurved to submedian when it suffuses with the postmedial line, which is outcurved above vein 6, then obliquely incurved

to inner margin; subterminal streaks on veins, those on veins 4 and 6 nearer the termen; cilia yellowish white. Hind wings yellowish white.

Expanse, 23 mm.

Habitat.—Mt. Salak, Java.

Type.—Cat. No. 25169, U. S. Nat. Mus.

Collected by Bryant and Palmer.

Near *Asura fulgurites* Hampson.

***Asura delia*, new species.**

Female.—Head, collar and thorax maize yellow. Abdomen whitish ochre. Body below and legs whitish ochre. Fore wings maize yellow; antemedial space from subcostal to submedian, the medial space from cell to inner margin and the veins postmedially to near termen drab. Hind wings white very faintly tinged with maize yellow. Fore wings below with the drab shadings showing faintly through.

Expanse, 17 mm.

Habitat.—Medan Deli, Sumatra.

Type.—Cat. No. 25170, U. S. Nat. Mus.

Received from L. P. de Bussy.

The markings of fore wing somewhat like *Asura nebulosa* Moore.

***Asura tronga*, new species.**

Female.—Head white; collar and thorax buff; abdomen whitish gray, the anal tufts drab. Fore wings pale maize yellow, the markings smoky drab; a long antemedial streak above cell, shorter streaks below cell, submedian fold, and submedian vein, those below cell and submedian inset; the cell, medial space below cell from middle to inner margin, and veins beyond to near termen broadly smoky drab, the shading on veins terminally ending in a point. Hind wings white. Fore wings below light drab, the inner and outer margins light maize yellow.

Expanse, 16 mm.

Habitat.—Khow Sai Dow Mt., Lower Siam.

Type.—Cat. No. 25171, U. S. Nat. Mus.

Collected by Dr. W. L. Abbott.

***Asura indentata*, new species.**

Male.—Head, collar, thorax and fore wings light salmon orange. Abdomen white, the terminal portion yellowish pink. Fore wings with the markings smoky black; basal third of costa finely black; a subbasal point on subcostal; a medial line, indentate on median, with a line projecting towards base; an antemedial line on submedian, connected on one wing with the medial line; a point on discocellular; a curved, remote, post-medial series of small oval spots on veins, the spot on vein 5 inset, on vein 4 outset; terminal points on veins; cilia on costa and termen pale yellow. Hind wings white suffused with pink.

Expanse, 16 mm.

Habitat.—Mt. Salak, Java.

Type.—Cat. No. 25172, U. S. Nat. Mus.

Collected by Bryant and Palmer.

Near *Asura parallelina* Hampson.

***Asura acteolina*, new species.**

Male.—Head and thorax orange yellow; black points on shoulders and patagia; two black points on thorax behind collar. Abdomen above ochraceous brown, the base whitish. Fore wings orange yellow; base of costal edge black; a black basal point; a subbasal larger point in cell; a spot below cell more outset; antemedial points above and in cell; small spots above and below submedian, the lower spot inset; a thick black medial line almost vertical; a black point at end of cell; post-medial small black spots on veins 1, 2 and 10; subterminal spots on veins 3, 6, 7 and 8; terminal points on veins connected by a line at apex. Hind wings white faintly tinged with yellow.

Expanse, 18 mm.

Habitat.—Mt. Salak, Java.

Type.—Cat. No. 25173, U. S. Nat. Mus.

Collected by Bryant and Palmer.

Nearest *Asura acteola* Swinhoe.

***Asura euproctis*, new species.**

Male.—Head and thorax cream color; collar and patagia orange yellow; abdomen light yellow. Fore wings purplish

gray; costal margin pale yellow, expanding medially, narrow postmedially, expanding again before apex; termen rather broadly pale yellow. Hind wings below similar, but duller.

Expanse, 16 mm.

Habitat.—Mt. Salak, Java.

Type.—Cat. No. 25174, U. S. Nat. Mus.

Collected by Bryant and Palmer.

Unlike any described species.

***Asura lunilinea*, new species.**

Male.—Head, collar and thorax white with olive ochre markings; a point on frons, a spot on vertex, and spot on tegulae, a large spot on thorax, a small spot on patagia and line below shoulders. Abdomen above showing fuscous segmental lines through the white hairs; underneath white. Fore wings white, the markings olive ochre; some irrorations and a small basal spot on costa; a streak below cell; a thick outcurved antemedial line, somewhat narrower in cell; a medial line curved from costa to median, then straight and vertical but narrower to inner margin where it expands slightly; postmedial line slightly outcurved and almost touching medial line below cell, on costa connected with that line by a downcurved line, thus forming almost a circle around the discocellular space; a small black brown spot on discocellular; from vein 2 the postmedial consists of a fine line to inner margin; subterminal spots above vein 8 and between 6 and 7 inwardly suffusing; smaller spots on veins 4, 3 and 2, the last reaching inner margin; a terminal line partly interrupted with small spots extending on cilia. Hind wings thinly scaled, white, without markings. Fore wings below showing in transparency all the markings of upper side.

Expanse, 18 mm.

Habitat.—Los Baños, Philippine Islands.

Type.—Cat. No. 25175, U. S. Nat. Mus.

Collected by C. F. Baker.

Near *A. hilaris* Walker.

***Asura bakeri*, new species.**

Male.—Head, collar and thorax white with olive markings;

a spot on frons, vertex, tegulae and patagia; streaks on thorax. Abdomen white, the two last segments dark gray, the anus white. Fore wings white with olive lake markings; a small spot at base of costa; two large subbasal spots, one on costal margin and one in and below cell not reaching submedian; a broad curved antemedial fascia interrupted at median vein, not touching inner margin; from upper part of fascia at vein 3 a fine broken fuscous line, expanding on inner margin where it becomes olive lake; at and beyond end of cell an oval oblique fuscous black spot; a postmedial spot on costa outcurved to vein 5, below vein 5 a series of elongated fuscous spots on interspaces to submedian, the longest spot between veins 2 and 3; terminal space with elongated olive lake spots above vein 8 and between 5 and 7; a large spot from vein 5 to near tornus which remains white; there is only a narrow white line between the postmedial and terminal spots; small terminal spots on apical half. Hind wings white, with faint ochreous shade at apex and on terminal space. Fore wings below showing indistinctly the markings of outer half of wing. Hind wings below with a faint subterminal ochreous shade.

Expanse, 20 mm.

Habitat.—Los Baños, Philippine Islands.

Type.—Cat. No. 25176, U. S. Nat. Mus.

Collected by C. F. Baker.

Near *A. hilaris* Walker.

***Asura mindanensis*, new species.**

Female.—Body and wings white, the markings all isabella color; a lateral streak on palpi; a small spot on vertex and front of tegulae, a large spot on patagia; fore wings with a small spot at base of cell; small subbasal spots on costa and close below cell; a large outbent antemedial spot on costa to within cell, and an inbent spot from base of vein 2 to just below submedian; a round spot at discocellular; a fine outcurved postmedial line, expanding inwardly to form spots on costa, at vein 5 and between veins 3 and 2, broken at submedian with an inset spot on inner margin; three large subterminal spots

above vein 8, from vein 7 to below vein 6, from above vein 4 to vein 3, and a narrower spot at inner margin; cilia dark shaded. Hind wings thinly scaled, with a faint spot at apex. Fore wings below showing all the spots in transparency, the post-medial spots towards costa and those towards apex distinct.

Expanse, 20 mm.

Habitat.—Mindanao, Philippine Islands.

Type.—Cat. No. 25177, U. S. Nat. Mus.

Received from C. F. Baker.

Near *A. bakeri* Schaus.

***Miltochrista poststrigata*, new species.**

Female.—Head, collar and thorax maize yellow; a black point on vertex, shoulders and patagia. Abdomen light ochraceous buff. Fore wings maize yellow, partly tinged with light ochraceous buff; base of costa finely black; a black brown basal spot below cell, and similar subbasal spot in cell; markings otherwise buffy brown; an antemedial line outangled above median, and inbent to inner margin; medial line sinuous, inbent from costa and suffusing with antemedial at median, then almost straight to inner margin; postmedial line broad, remote, slightly outcurved below costa and followed by streaks connected with it and not reaching termen, those on veins 4, 6 and 8 longer; vein 10 with only a small terminal streak; cilia tipped with white. Hind wings white faintly tinged with yellowish.

Expanse, 31 mm.

Habitat.—Mt. Salak, Java.

Type.—Cat. No. 25178, U. S. Nat. Mus.

Collected by Bryant and Palmer.

Antemedial and medial lines reminding one of *M. cruciata* Walker, the postmedial line and streaks somewhat like *M. delineata* Walker.

***Miltochrista salakia*, new species.**

Female.—Head and thorax white, the latter with two black bars. Collar and patagia yellowish. Abdomen white tinged with yellow terminally. Fore wings white; a small basal spot

below cell; a larger subbasal spot across cell; base of costa finely black; three pairs of antemedial black lines, one outbent on costal margin, one inbent below cell and one below submedian fold; a sinuous black medial line, inbent from costa to near median then slightly outcurved to inner margin; a black point at end of cell; a deeply outcurved postmedial series of elongated black spots on veins followed by terminal black streaks expanding slightly on termen; cilia white. Hind wings white with faint terminal black points on veins 7 and 8. Fore wings below with the markings paler, the postmedial and terminal streaks suffusing.

Expanse, 28 mm.

Habitat.—Mt. Salak, Java.

Type.—Cat. No. 25179, U. S. Nat. Mus.

Collected by Bryant and Palmer.

Near *M. syntipica* Swinhoe.

***Eugoa translineata*, new species.**

Female.—Head, collar and thorax pinkish buff; two small black spots on anterior half of thorax, and a large spot on patagia. Abdomen slightly paler. Fore and mid tibiae and tarsi fuscous; a fuscous streak on hind tarsi below. Fore wings pinkish buff with some darker striae and irrorations and crossed by two thick black lines, the antemedial vertical, the postmedial slightly incurved on costa; a small black spot in cell above vein 3, and a black point on discocellular obliquely beyond it; the outer edge of postmedial somewhat diffuse; a subterminal fine fuscous line, deeply incurved above vein 5 and below vein 3, with fuscous points. Hind wings ivory yellow, the apical half of termen tinged with pinkish buff. Fore wings below drab, the costa medially, inner and outer margins narrowly yellowish.

Expanse, 23 mm.

Habitat.—Los Baños, Philippine Islands.

Type.—Cat. No. 25180, U. S. Nat. Mus.

Collected by C. F. Baker.

Eugoa nabis, new species.

Male.—Palpi fuscous. Body and fore wings cream buff. Fore wings: A black point at end of cell; a very faint series of postmedial minute clusters of brown scales on veins; a subterminal black point above vein 6; marginal black points above vein 2 and at vein 4. Hind wings slightly whiter. Fore wings below gray drab. Hind wings below paler.

Expanse, 18 mm.

Habitat.—Los Baños, Philippine Islands.

Type.—Cat. No. 25181, U. S. Nat. Mus.

Collected by C. F. Baker.

Eugoa mistra, new species.

Male.—Body light drab, legs with darker streaks. Fore wings light drab with some creamy white irrorations; the lines black; a subbasal line across costal margin; antemedial line oblique and dentate to near median, then vertical and wavy to inner margin; a large velvety black point at end of cell; postmedial not very distinct, from costa above the point, outangled beyond it. and downcurved to inner margin below the point; a faint subterminal line outbent from costa, inangled at vein 6 and at vein 4, then outbent to tornus. Hind wings tilleul buff. Fore wings below drab, showing only the black points of upper side.

Expanse, 16 mm.

Habitat.—Los Baños, Philippine Islands.

Type.—Cat. No. 25182, U. S. Nat. Mus.

Collected by C. F. Baker.

Allied to *E. bipunctata* Walker.

**A NEW COLORATION KEY FOR THE SPECIES OF
THE GENUS GOELDIA**

(*Diptera, Culicidae*)

BY J. BONNE-WEPSTER AND C. BONNE

In Volume IX of this periodical we published a key for the species of the genus *Goeldia*. In the third dichotomy we put down 5, which obviously should have been 4, because the first dichotomy pointed down to 5 already. The result of this error

was a second error by Dyar in his comment on our paper in the same number, where he placed *Goeldia trichopus* Dyar near *frontosa* Theobald. *Trichopus* has white on the legs, however.

We give a new table now, including all the known species of *Goeldia*, except *lineata* Lutz and *paranensis* Brèthes, the position of which is uncertain.

TABLE OF THE SPECIES OF THE GENUS GOELDIA

1. Mid tarsi only marked with white,
lampropus Howard, Dyar and Knab
Hind tarsi marked with white..... 2
Tarsi all black..... 6
2. Hind tarsi marked with white at bases of joints; mid tarsi
without white.....*schedocyclica* Dyar and Knab
White markings at the tips of mid and hind tarsi..... 3
3. Second hind tarsal joint not ciliate; tip of fourth joint white,
leucopus Dyar and Knab
Second hind tarsal joint ciliate; over half of the fourth joint
white 4
4. Mid legs with all of the second joint white nearly all round,
trichopus Dyar
Mid legs with white only on outer half..... 5
5. Palpi of female as long as six joints of antennae *longipes* Fabricius
Palpi of the female as long as four joints of antennae,
culicivora Dyar and Knab
6. Proboscis very long and slender at least as long as the abdomen.. 7
Proboscis moderately long, shorter than the abdomen.....11
7. Abdominal colors separated in a nearly straight line..... 8
Abdominal colors incised..... 9
8. Scutellum silvery on mid lobe,
dicellaphora Howard, Dyar and Knab
Scutellum with peacock scales.....*frontosa* Theobald
Scutellum concolorous with mesonotum.....*perturbans* Williston
9. Scutellum with peacock blue scales.....*rapax* Dyar and Knab
Scutellum concolorous with mesonotum..... 10
10. Large species; venter and abdominal incisions golden,
lunata Theobald
Small species; venter and abdominal incisions silvery,
espinii Martini
11. Scutellum concolorous with mesonotum.....*fluvialis* Theobald
Scutellum with peacock blue scales.....12
12. Abdomen violet above.....*vonplesseni* Dyar and Knab
Abdomen bluish green above.....*pallidiventer* Theobald

NEW CHALCID-FLIES FROM EASTERN
AUSTRALIA

I

(Hymenoptera, Chalcididæ)

By A. A. GIRAULT

The types of the following species are deposited in the Queensland Museum at Brisbane.

Hexanusia, new genus.

Runs to *Zooencyrtus*, but mandible 3 truncate, wide but not very. Dilation of scape distad and not great. Scrobicular cavity large, forming a horseshoe. Frons moderately wide. Marginal two and a half times longer than wide, a bit exceeding stigmal, which somewhat exceeds postmarginal.

Hexanusia nigricornis, new species.

Black, aeneous, and like the as yet manuscript *Australencyrtus* genotype; tips tibiæ (widely in 2), knees except hind, tarsi reddish yellow; wings clear, veins black. Frons finely scaly, and with only two widely separated rows of pin-punctures crossing it. Funicles quadrate, but 1 somewhat longer, not quite equal pedicel; scape black.

One female, Wynnum, Queensland.

Perilampus tassoni, new species.

Green; knees, tibia 1 beneath, tibial tips, tarsi, tegulæ and flagellum save pedicel, reddish. Punctate; parapside centrally toward caudal end with a small, finely lined, impunctate area; occiput finely circularly lined; upper face thick, with distinct pin-punctures; vertex same, the ocellar area cross-lined; ocelli in a curved line. Middle face smooth, ventral line upper, also clypeus, but punctures sparser. Lower cheeks finely circularly striate, with scattered pin-punctures, along the eyes smooth. Postmarginal about twice the stigmal, about three-fourths marginal. Propodeum with a pair of median carinæ, from thence nearly to spiracle, microscopically longitudinally lined, thence laterad gibbous and punctate. Abdomen 2 from caudal

aspect, very densely and finely pin-punctate, almost glazed at caudal half.

A female, Inkerman, Queensland, jungle, December 9, 1917.

Lamennaisia, new genus (Encyrtini).

Small. Jaws small, 4-dentate, teeth small, subacute, 4 abruptly much shorter than others, nearly half shorter than 3, 1-2 a bit shorter than 3. Marginal quadrate, stigmal and post-marginal long, equal. Frons moderately wide, scrobes long, deep. Scape simple, flagellum cylindrical, club wider, funicles subquadrate, 1 smaller, cup-shaped, pedicel twice funicle 2. Club somewhat over half funicle. Four lines of cilia proximad hairless line.

Lamennaisia quadridentata, new species.

Black, wings clear; tarsi, knees, tibial tips, distal half tibia 2, yellowish; venation black. Sculpture fine. Abdomen short, depressed, triangular; thorax convex. Scape suffused with pallid at apex.

A female, forest, May, 1919, Ipswich, Queensland.

Neanastatus ariostoni, new species.

The same as *aurivertex*, but laterad ocellus not twice closer to eye than to cephalic ocellus, of prothorax only pronotum lemon and the vertex; pale parts of legs silvery, tibia 3 purple save basal fourth and apex more narrowly. Head entirely orange except the stripe across upper occiput. Abdomen wholly metallic.

Ipswich, Queensland, forest, October 26, 1919.

Quadrastichodella nova, new species.

Peculiar, flattened aspect. Green, coxæ, femur 3 same, wings clear; rest of the legs pale yellow, antennae green. Funicles equal, half wider than long; pedicel large, long, two-thirds scape which equals club; ring joints very distinct, 1 largest. Head rather long, pronotum transverse quadrate. Densely scaly, propodeum apparently with median carina at base. Postmarginal somewhat developed. Femora 1 and 2

green at basal half, more or less. Generic characters very distinct.

Forest, Pentland, November, 1919.

Anagyropsis mercurius, new species.

Like *mazzinini* but only coxa 3 green. Antennæ black, funicle 1 longest, much exceeding pedicel, four times longer than wide, 6 subequal pedicel. Fore wing lightly smoky, clearer at base widely. Vertex, scutellum rather densely pin-punctate. Lateral ocellus against eye. Scape greatly dilated.

Brisbane, from a leaf in a park, May 23, 1921.

Parerotolepsia chauceri, new species.

Like genotype, but 1 of hind tarsi elongate, distinctly exceeding 2 and 3 together and twice the longest tibial spur.

Nelson, forest, April.

Uriolelaps keatsi, new species.

Dark aeneus, wings lightly infuscated, base clear nearly to end submarginal vein; scape, club, trochanters, base of femora and tarsal joint 1, white. Legs yellow save coxæ and femur 3. Mandibles tridentate. Clypeus glabrous, quadrate. Funicle 1 twice its width, a bit shorter than pedicel. Head scaly, finely rugulose beneath antennæ, latter 13-jointed, one right joint, three club joints. Upper thorax finely scaly, with depressed hairs; a large seta on scutum each side distad of middle. Scutellum with cross-suture a bit distad middle, longitudinally striate distad of this and naked. A large fovea caudad the small round spiracle on propodeum, no sulcus, median carina forked at base, a semicircular carina crossing it, looping around to apex of neck, enclosing a square. Abdomen 2 half surface, petiole substrate. Venation as genotype, paraspidal furrows nearly as widely separated at apex as the axillæ.

Fishery Creek, Queensland, jungle, June.

Epistenia miripes, new species.

Aeneus, densely punctate; basal two-thirds scape, funicles 6-7 (counting ring-joint as 1), coxæ 1 and 2 and apex of 3, femora 2 and 3 save over distal third laterad (in 2, distal

fourth mesad also, the dark continuous), knees 1 and 2, tibiae 1 and 2 save dorsad (and middle of 2, which is black at base dorsad), femur 3 save distal half save apex, tibia 3 save basal and distal fourth and tarsi 3, white; tarsi 1 and 2 brown. Antennae at eye-ends, scrobes deep, ocelli in about equilateral triangle. Funicle 1 narrower, somewhat longer than wide, 2 twice longer than wide, shorter than pedicel, others gradually shortening; club long, solid. Propodeum foveate along cephalic edge, a median carina forked from base (rather a flat, triangular one, declivius and near base coming to a somewhat elevated cone), a curved lateral carina with a lateral branch about its middle. Abdomen acuminate, longer than rest of body, last two segments stylate, all except at base, finely cross-wrinkled. Fore wing with apex brown, a cross-stripe apex stigmal, widening centrally, there with a long proximal arm like a shaft in the form of half an arrow-head. Postmarginal elongate.

National Park, Queensland, February, 1921 (G. H. Hardy through the kindness of the Queensland Museum).

***Echthrobacca luciani*, new species.**

Like genotype, but legs except tibial tips, tarsi, knees, distal two-thirds tibia 2, concolorous, other parts yellowish. Ovipositor a bit extruded, white at apex. Mandible 3 truncate, but not very wide; funicles 1 and 4 equal, quadrate, 2 and 3 shorter, 5 and 6 quadrate, largest. Pedicel exceeding funicles. Marginal one-third longer than stigmal, about twice postmarginal. Scutellum convex, reaching base of abdomen, dorsal thorax hispid. Marginal over two-and-a-half times longer than wide.

Forest, Tumoulin, Queensland, March 12, 1919.

***Eusemionella rara*, new species.**

As *hemiptera* but pale yellow, abdomen with moderately wide sub-metallic cross-stripe at middle, tibia 3 purple near base, funicle 6, club 1 black, also apex of shortly extruded ovipositor valves; clothing of caudal scutum sparser. Funicles 1-3 quadrate, 5-6 somewhat longer than wide, club five-sixths the funicle. Fore wing twice longer than wide, obliquely truncate at apex, submarginal extending nearly to apex, a single large

seta near its end; basal third fore wing dusky; a few scattered discal cilia. Head inflexed.

Tumoulin, forest, March 12, 1919.

Omphalomorphella tassoni, new species.

Robust, like a rather large *Rhicnopeltella*. Shining black, wings clear, veins black; tarsi except last joint and tibial tips, yellowish white, latter more widely in legs 2. Sculpture fine, scutum with evident setigerous pin-punctures, scutellum naked, three large setæ along each side. Abdomen stout, ovate, pilose. Postmarginal about half longer than stigmal, somewhat shorter than marginal, latter somewhat longer than postmarginal. Funicles a bit wider than long, 3 and 4 shorter; ring-joint 2 twice 1. Club with apical spine. Many not gross setæ on submarginal.

Ipswich, Queensland, forest, May, 1919.

Procheiloneurus perbellus, new species.

From genotype: Ovipositor not extruded, scape stout, marginal only two-and-one-half times longer than wide, equal stigmal, postmarginal third shorter. Fore wing deep brown, crossed by a flat-triangular (obtuse apex proximad) clear stripe, half way to apex from venation; also a wide stripe between base and marginal vein. Purple; frons along eyes, mouth, pronotum except lateral margin, center propleurum, scutellum, distal half plus scutum, orange; coxae white; first two pairs legs missing; trochanters, base and apex femora, apex tibiæ and tarsi of hind legs, also funicle white. Funicles 2-4 shortest, twice wider than long, 6 largest, 1 quadrate, smaller than 6; club long, not much wider. Frons moderately narrow. Vertex nearly flat. Caudal margin narrowly and caudo-lateral corners more widely of scutum, metallic.

Kamma, Queensland, forest, January, 1918.

Systasis quadridentatus, new species.

Rather slender. Aeneus, wings clear; legs save coxae, femora 3 and femora 2 ventro-laterad widely at middle, white. Scaly; finely punctulate, the short propodeum with an obscure median carina. Ovipositor extruded one-fifth abdomen. Stig-

mal half of marginal a bit shorter than postmarginal. Wings wide. Tooth 3 of 4-denate mandible abruptly shorter than the others. Funicle 1 quadrate, equal pedicel. Resembles species referred to *Schizonotus*.

Wynnum, Queensland, forest, May 24, 1921.

***Neanastatus rabalaisi*, new species.**

Like *punctaticeps*, but coxae metallic, leg 1 reddish brown except femur at base, 2 the same except most of the femur except at tip; scape black, red at extreme base. Middle tibial spur black, also entire tarsus.

Forest, Ipswich, May, 1919.

***Kakaoburra*, new genus.**

Runs to *Echthrobacca* Perkins, but stigmal and postmarginal equal, half the rather long marginal; jaw teeth subacute, subequal, funicles longer than wide. Maxillary palpi apparently 3-jointed.

***Kakaoburra fera*, new species.**

Aeneus, wings clear, legs except tibia 2, tibial tips and tarsi, which are brownish, concolorous; also antennae. Funicles 1-4 equal pedicel, twice longer than wide, rest shortening. Club conic-ovate, not quite half of funicle and not much wider. Abdomen and scutellum pointed.

Watsonville, Queensland, forest, mid-March, 1919.

***Anagyropsis irvingi*, new species.**

Robust, ovipositor extruded for length of abdomen nearly. Green, legs and antennae (save scape and pedicel except at apex), straw yellow, wings clear. Tegulae and lunula before them yellow. Marginal punctiform, postmarginal and stigmal equal, long. Funicles 1-2 equal, half longer than wide, exceeding pedicel. Scutum with rather dense, fine thimble-punctures, less distinct on scutellum and vertex. Scape's dilation moderate. Discal cilia fine and dense to hairless line, proximal sparse. Hairless line widening distad, not very clearly defined. Scutellum large, peltato-triangular.

Capeville, Queensland, forest, November, 1917.

Gonatocerus bifasciatiiventris Girault.

Types from Java. Two females compared with them, taken by sweeping grass in secondary forest growths, boggy land, Cannon Hill, Queensland, April 18, 1921.

Elasmus longifasciatiiventris, new species.

Runs to *muscoides*, but abdomen metallic as follows: 2 at basal third, 6 and following, meson widely of 2-5, same narrowly of venter and 6-8 ventrad except narrowly 6 ventro-laterad. Lemon as follows: Postscutellum except base, base of tegula, legs except basal two-thirds coxa 3. Mandibles 6- and 7-dentate, scape pale beneath. Funicles equal, over twice longer than wide.

Cannon Hill, Queensland, forest, July 7, 1921.

Elasmus taurus, new species.

Like *minor*, but abdomen 5-8 green above, a crescent meson of 3, base of 4 green except laterad, coxa 2 so at base; post-scutellum lemon; mandible 7-dentate. Funicle 1 twice longer than wide. Less than basal half of coxa 3 green.

Goondi, Queensland, jungle, September.

Elasmus firdonsini, new species.

Like *nakomara*, but marginal dots base abdomens 3-6, mesal spot middle 3 and 4, dot meson 6; femors metallic dorsad. Flagellum dark, funicle 1 longest; upper half green save dot at eye. Jaw 6-dentate.

Wynnum, Queensland, forest, November 7, 1920.

Elasmus aeschlyi, new species.

Like *helena*, but small spot on mesopleurum above coxa, propodeum yellow laterad at cephalic margin, a transverse mark laterad apex scutellum, dorsal edge femur 3 green.

Wynnum, Queensland, forest, March 13, 1921.

Elasmus richteri, new species.

Like *ero*, but wings infuscated at distal third or more, this darkness with oblique proximal margin from near end of marginal, caudo-proximad to hind margin. Abdomen green:

Basal third of 2, spot base of 6, lateral margin, 7-8. Scape beneath and at base, pale. Jaws 5-dentate. Coxa 1 at base, other coxæ, femur 2 above and beneath and irregularly across at about center, femur 3 save each end (base widely), green. Funicle 1 over twice longer than wide.

Manly, Queensland, forest, September 21, 1920.

Elasmus virgilii, new species.

Like *grimmi*, but femur 3 all green, so abdomen above save distal half of 2, 3 and middle of 6. Jaws 10-dentate.

Forest, Wynnum, Queensland, April 8, 1920.

Elasmus froudei, new species.

Like *mandibularis*, but first legs save extreme base coxa, each end rather widely of femora 2 and 3, also pallid; scape all green, so postscutellum save distal edge. Jaws 10-dentate.

Forest, Ipswich, Queensland, June.

Stomatoceras dipterophagus, new species.

Black, wings as in *carlylei*, following parts red: Legs except coxa 1 laterad, distal half pedicel, funicle 1, tegulæ, dorsal abdomen—distal half 2, 3, 4 (except distal margin, except laterad); ventral abdomen—all except last three segments; lateral—2-6. Funicle 1 quadrate, 2 subequal pedicel and 3. Postmarginal somewhat exceeding marginal, over twice stigmal. Apex scutellum as in *livii*, seen from above, but teeth not so strong, obtuse. Hind femoral teeth as in *livii*. Lateral ocellus nearly twice closer to eye than to cephalic (in *livii* about half between the two). Prominence over hind coxa not truncate, rectangular but conical, mound-like. Abdomen as in *livii*, as to sculpture. Male-wings clear, antennæ black, filiform, funicle 1 elongate, 2-3 equal, shorter, rest quadrate, pedicel very small; abdomen ventrad, ventro-lateral red, above so only middle across of distal half of 2, basal half of 3.

A pair reared from *Passeromyia* larvæ infesting birds' nests, Mackay, Queensland, May 27, 1920 (E. W. Ferguson). Received through the kindness of Dr. T. Harvey Johnson.

Fulgoridicida babindae, new species.

First four funicles equal, twice wider than long, each half of 5, latter still wider than long, 6 large, quadrate. Dark aeneus, wings clear, venation dark, knees, tarsi, tibial tips yellowish. Frons moderate. Pedicel a bit exceeding funicle 6, which is wider than rest; club nearly equal funicle and wider. Marginal a bit longer than wide, not thickened, equal postmarginal, stigmal twice or more longer. Jaw teeth minute, 2 thicker than 1. Hypopygium covering ovipositor to tip. Sculpture fine. About eight lines coarse cilia proximad hairless line, hind wings about seven lines discal cilia. Setae from submarginal long and slender.

Babinda, Queensland jungle, September, 1918.

Australanusia, new genus.

Runs to *Paracalocerinus*, but mandible 2 widely truncate, 1 subacute and shorter, marginal shorter, only about twice the stigmal; ovipositor one-third abdomen. Scape compressed, but not foliceously. Maxillary palpi four-jointed. Marginal twice stigmal, latter somewhat exceeding postmarginal.

Australanusia pilosithorax, new species.

Aeneus, wings lightly dusky, veins blacker; legs, antennae concolorous except reddish knees and tarsi; abdomen depressed, produced beneath, pointed. Thorax with whitish pubescence which is prostrate. Scrobes forming a long triangle. Funicles subequal, twice wider than long, club not much enlarged, exceeding funicle. An infuscation against marginal vein. Hairless line open caudad, closed cephalad, many lines of dense, somewhat coarser cilia proximad of it. Pedicel not long.

Wynnum, Queensland, forest, June 8, 1921.

Paratoximopsis, new genus.

Like *Toxemoides* genotype, but stigmal long, with distinct neck and only half postmarginal, paraspidal furrows not deep; abdomen 2 the whole surface, petiole exceeding coxa 3; two ring-joints. Abdomen as in *Perilampus* as to shape of body. Scutellum peltate, narrow, from lateral aspect, terminating in an acute point, oblong, axillae nearly wholly laterad of it.

Paratoximopsis oblongiscutellum, new species.

Like type of named genus, but tibiae and tarsi yellowish white, femur 2 above reddish brown, knees reddish. Propodeum punctate-scaly along median carina; scutellum less sculptured than scutum. Head finely circularly lined; antennae on middle of face. Clypeus with convex distal margin. Scrobes long, deep.

Ravenshoe, jungle, March 13, 1919.

Mesanusomyia, new genus.

As *Anusomyia*, but scape slender, marginal thrice longer than wide, a bit shorter than stigmal, postmarginal somewhat longer than stigmal; minute 2 of curved acute jaw at center of inner side of 1. Ovipositor not free. Species like *Phaenodiscoides*, *Hexencyrtus*, *Australencyrtus*.

Mesanusomyia fera, new species.

Green, wings faintly dusky. Legs yellow-brown except coxa 1 and femur 1 at proximal two-thirds or nearly; scape save at apex, yellowish red, club white. Funicles twice longer than wide, 6 shorter, 1 a bit shorter than pedicel. Antennae at clypeus. Scutum hairy, scutellum glabrous. Costal cell with three lines discal cilia.

Ravenshoe, jungle, March 13, 1919.

Ceraptrocera subaptera, new species.

As *emersoni*, but wings abbreviated, fore thrice longer than wide, truncate at apex, costal cell wide, marginal linear, stigmal short; fore wing dusky, no marginal cilia, several lines coarse discal, hyaline as follows: Along submarginal base at apex basal three-fourths, thence across to caudal margin, where dividing it runs near this margin to base and to apex, the distal branch widely interrupted before apex; an oblique mark disto-caudad from base of marginal. Ovipositor free.

Perhaps a form of *emersoni*. Nelson, forest, August. Also at Cairns in January.

Parexoclaenus bomboides, new species.

Length, 6 mm. Black, lemon as follows: Large, oblique

stripe on upper face, its dorsal half against the scrobe, ending at eye nearly opposite antennae; a narrow, concaved line across pronotum near cephalic margin, hind margin of same save laterad (the yellow cephalic margin to a dark red caudal margin of pronotum); lateral margin scutum at caudal half; hind margin scutellum; a dot on cephalo-lateral angle propodeum; an ovate spot base coxa 3 dorsad; an oblique, elliptical mark each side meson, base dorsal abdomen, a wide stripe across whole dorsum and nearly all pleurum, abdomen 5 (save cephalic and caudal margins); basal (more widely) and dorsal margin thinly of lateral aspect femur 3. Following parts reddish: Antennae save scape above and sides near base, funicles more or less; a dot center scutum, each side of meson; tegulae; coxal apices narrowly, tibiae, tarsi, knees (including apices of all femora, in hind the red invading the black along ventral margin to tooth 4. Hind femora laterad as widely yellow at base as red at tip; mesal aspect black, distal fourth red. Stigmal much exceeding marginal, which is barely longer than wide. Scape yellow ventrad. Middle femoral furrow smooth. Mesal aspect femur 3, punctulate. Coxa 3 acute distal half dorsal edge. Lateral margin propodeum obtusely ridged; a curved lateral carina. Like *vespoides* otherwise and resembles a common, small, paper-nest wasp of the forest, *Isaria gregaria*, maybe, but more closely a non-petiolate, 2-banded wasp of about the same stature and of the jungle.

Nelson, window, December 16, 1918.

Thaumasura nonstylata, new species.

Length, 7 mm. Aeneus save long 1 of tarsus 2, which is white; abdomen normal, non-stylate, ovipositor not extruded, plate of scutellum projecting from apex like a blunt cone and bears a carina on each side of meson. Fore wing with thick but rather light crescentic cloud from stigmal knob, curving nearly to apex submarginal. Postmarginal twice stigmal. Funicle 1 a ring-joint, 2 thrice longer than wide, exceeding the long pedicel, 8 exceeding 7, equal club. Sparsely punctate; propodeum with a thin median carina and no others.

Wynnum, Queensland.

A NOTE ON *BELLURA GORTYNOIDES* WALKER*(Lepidoptera, Noctuidæ)*

By HARRISON G. DYAR

Hampson placed *Arzama densa* Walker as a synonym of *Bellura gortynoides* (Cat. Lep. Phal. Brit. Mus., ix, 261, 1910) on the assumption that both had a smooth clypeus. Later Barnes and McDunnough, on reëxamination of the type, find that *Arzama densa* has a tubercle on the clypeus (Cont. Nat. Hist. Lep. N. A., ii, 200, 1914), and they resurrect the genus *Arzama*, making *Sphida* a synonym of it. They remark that "it is quite generically distinct from *Bellura gortynoides*," but it does not appear that they actually examined the type of the latter in detail. A number of specimens are before me, identified as *Bellura gortynoides*, all of which on careful examination show a tubercle on the clypeus. I suspect, therefore, that this may be the case in Walker's types also. If so, Hampson's synonymy of *densa* = *gortynoides* may be restored, and *anoa* Dyar will probably also fall into the synonymy, as it seems to be only a dark suffused specimen. A more serious consequence would be that the species without a clypeal tubercle will be without a generic name. I propose **Arzamopsis**, type *Arzama diffusa* Grote. This species has a smooth front. The other form going with it, *melanopyga* Grote, has in a type before me no tubercle; another specimen, however, has a small trace of tubercle, a small white spot, visible to the lens, though easily passed over with a pin.

Arzama matanzasensis, new species.

Intermediate between *obliqua* Walk. and *anoa* Dyar. Wing-shape of *anoa*, markings of *obliqua*, more reddish, the basal-costal pale area less contrasted; median area broadly dark-shaded and with an oblique mesial line as in *anoa*. Expanse, 50 mm.

Type, female, No. 25048, U. S. Nat. Mus.; Matanzas, Cuba, July, 1902 (W. Schaus).

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THE AMERICAN AEDES OF THE SCAPULARIS GROUP

(Diptera, Culicidae)

By HARRISON G. DYAR

In this group there is no sharp separation to be made between the species on the characters of the male hypopygium. All are essentially alike. The group itself, however, is sharply marked, as shown by me (Ins. Ins. Mens., viii, 104, 1920). The group is wholly American, having no representative in Europe. The species are separable by the coloration of the adult, as follows:

Mesonotum entirely yellowish brown.....*thelcter* Dyar
Mesonotum with two yellow lines on a brown ground, the dorsal area brown.

The yellow lines very broad.....*obturbator* Dyar & Knab

The yellow lines moderate, straight.....*trivittatus* Coquillett

These lines narrow, widening posteriorly....*cuneatus* Dyar & Knab

These lines very narrow, straight....*angustivittatus* Dyar & Knab

Mesonotum with a broad central golden band, the sides brown.

Smaller species, abdominal bands narrow, pale....*tortilis* Theobald

Larger species, the abdomen with lateral white spots..*lynchii* Brèthes

Mesonotum with a broad central silvered area.

Silvery area straight, running back to scutellum...*crinifer* Theobald

Silvery area rounded, situated anteriorly.

Abdomen with basal segmental bands above,

condolescens Dyar & Knab

Abdomen without dorsal bands.

Hind tibiae entirely black.

Legs bright bronzy brown; dorsum of abdomen

metallic.....*infirmatus* Dyar & Knab

Legs and dorsum of abdomen black,

euplocamus Dyar & Knab

Hind tibiae with a pale stripe below....*scapularis* Rondani

SPECIES 1

Aedes (Ochlerotatus) obturbator Dyar & Knab.

Culex trivittatus Coffin (not Coquillett), in Shattuck, The Bahama Isl., 289, 1905.

Aedes obturbator Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 9, 1907.

Aedes obturbator Theobald, Mon. Culic., v, 485, 1910.

Aedes obturbator Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 778, 1917.

Aedes (Ochlerotatus) obturbator Dyar, Ins. Ins. Mens., vi, 77, 1918.

Aedes (Heteronycha) obturbator Dyar, Ins. Ins. Mens., viii, 105, 1920.

The male of this interesting species is still unknown; but it is probable that when found it will correspond to the place assigned. The form is known only from the Bahama Islands.

SPECIES 2

Aedes (Ochlerotatus) trivittatus Coquillett.

Culex trivittatus Coquillett, Journ. N. Y. Ent. Soc., x, 193, 1902.

Culex trivittatus Smith, Ent. News, xv, 145, 1904.

Culex trivittatus Felt, Bull. 79, N. Y. State Mus., 333, 1904.

Culicada trivittatus Felt, Bull. 79, N. Y. State Mus., 391b, 1904.

Culex inconspicuus Grossbeck, Ent. News, xv, 333, 1904.

Culex trivittatus Smith, Bull. 171, N. J. Agr. Exp. Sta., 38, 1904.

Culex trivittatus Britton & Viereck, Rept. Conn. Agr. Exp. Sta., 1904, 269, 272, 273, 1905.

Culex trivittatus Smith, N. J. Agr. Exp. Sta., Rept. Mosq., 286, 1905.

Culex inconspicuus Smith, N. J. Agr. Exp. Sta., Rept. Mosq., 295, 1905.

Culex trivittatus Blanchard, Les Moust., 339, 1905.

Culex inconspicuus Smith & Grossbeck, Psyche, xii, 18, 1905.

Culicada trivittatus Felt, Bull. 97, N. Y. State Mus., 447, 1905.

Culex inconspicuus Dyar, Journ. N. Y. Ent. Soc., xiii, 108, 1905.

Aedes trivittatus Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 197, 1906.

Aedes inconspicuus Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 199, 1906.

Ochlerotatus trivittatus Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 18, 1906.

- Ochlerotatus inconspicuus* Coquillett, U. S. Dept. Agr., Bur. Ent.; Tech. Ser. 11, 21, 1906.
- Ochlerotatus trivittatus* Dyar, U. S. Dept. Agr., Bur. Ent., Circ. 72, 5, 1906.
- Ochlerotatus inconspicuus* Dyar, U. S. Dept. Agr., Bur. Ent., Circ. 72, 5, 1906.
- Aedes angustivittatus* Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 9, 1907.
- Pseudohowardina trivittata* Theobald, Mon. Culic., iv, 224, 1907.
- Culex inconspicuus* Theobald, Mon. Culic., iv, 438, 1907.
- Aedes trivittatus* Busck, Smiths. Misc. Colls., quart. iss., lii, 63, 1908.
- Culex (Ochlerotatus) trivittatus* Viereck, 1st Ann. Rept. Comm. Health Pa., 471, 1908.
- Culex (Ochlerotatus) inconspicuus* Viereck, 1st Ann. Rept. Comm. Health Pa., 471, 1908.
- Culex inconspicuus* Theobald, Mon. Culic., v, 387, 1910.
- Pseudohowardina trivittata* Theobald, Mon. Culic., v, 227, 1910.
- Aedes angustivittatus* Theobald, Mon. Culic., v, 485, 1910.
- Aedes trivittatus* Morse, Ann. Rept. N. J. State Mus., 1909, 719, 1910.
- Aedes inconspicuus* Morse, Ann. Rept. N. J. State Mus., 1909, 719, 1910.
- Aedes trivittatus* Headlee, Bull. 276, N. J. Agr. Exp. Sta., 103, 1915.
- Aedes trivittatus* Felt, 31st Rept. N. Y. State Ent., 67, 1916.
- Aedes trivittatus* Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 773, 1917.
- Aedes angustivittatus* Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 776, 1917.
- Aedes trivittatus* Dyar, Ins. Ins. Mens., v, 117, 1917.
- Aedes (Ochlerotatus) trivittatus* Dyar, Ins. Ins. Mens., vi, 77, 1918.
- Aedes (Ochlerotatus) angustivittatus* Dyar, Ins. Ins. Mens., vi, 77, 1918.
- Aedes (Heteronychia) trivittatus* Dyar, Ins. Ins. Mens., viii, 105, 1920.
- Aedes (Heteronychia) angustivittatus* Dyar, Ins. Ins. Mens., viii, 105, 1920.

This species inhabits the warmer parts of the United States, Massachusetts to Texas, Colorado and Montana, Mexico, Central America and Panama. The width of the yellow lines is subject to much variation. The narrow form was described from Mexico as *angustivittatus*; but similarly narrowly marked

specimens occur elsewhere, and the name cannot represent more than a variety. In southern Mexico and Central America a form occurs in which the yellow lines on the mesonotum are widened posteriorly or somewhat irregular. This may be distinguished as

***Aëdes trivittatus cuneatus* Dyar & Knab.**

Aëdes cuneatus Dyar & Knab, Proc. U. S. Nat. Mus., xxxv, 54, 1908.

Aëdes argentescens Dyar & Knab, Proc. U. S. Nat. Mus., xxxv, 55, 1908.

Aëdes cuneatus Theobald, Mon. Culic., v, 620, 1910.

Aëdes argentescens Theobald, Mon. Culic., v, 620, 1910.

Aëdes cuneatus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 770, 1917.

Aëdes (Ochlerotatus) cuneatus Dyar, Ins. Ins. Mens., vi, 77, 1918.

Aëdes (Heteronycha) cuneatus Dyar, Ins. Ins. Mens., viii, 105, 1920.

Besides the localities mentioned in the monograph, specimens have been taken in Costa Rica by Dr. A. Alfaro, Ciruelas, November 14, 1920; San José, November 22, 1920; Matapolo, January 16, 1921; Aquiares, February 28, 1921; Birris, March 12, 1921; Puntarenas, July 15, 1921.

SPECIES 3

***Aëdes (Ochlerotatus) tortilis* Theobald.**

Culex tortilis Theobald, Entom., xxxvi, 281, 1903.

Culex tortilis Theobald & Grabham, Mosq. or Culic. of Jamaica, 26, 1905.

Aëdes auratus Grabham, Can. Ent., xxxviii, 313, 1906.

Aëdes auratus Dyar & Knab, Proc. Biol. Soc. Wash., xix, 163, 1906.

Culex tortilis Theobald, Mon. Culic., iv, 428, 1907.

Culex tortilis Theobald, Mon. Culic., v, 598, 1910.

Aëdes tortilis Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 806, 1917.

Aëdes (Ochlerotatus) tortilis Dyar, Ins. Ins. Mens., vi, 77, 1918.

Aëdes (Heteronycha) tortilis Dyar, Ins. Ins. Mens., viii, 105, 1920.

This form inhabits the Antilles. In the monograph we treated the forms occurring on the several islands as species. I think it will be better to use the subspecific conception for

them. *Aedes tortilis tortilis* Theobald inhabits Jamaica, and gives its name to the species on account of having been described first. There are slight differences traceable in the mesonotal ornamentation in the specimens from the different islands, as given in the monograph (vol. iv, 617, dichotomies 62 to 64 of the table); but these are far from constant.

***Aedes tortilis plutocraticus* Dyar & Knab.**

Culex confirmatus Coffin (not Lynch), in Shattuck, The Bahama IIs., 282, 1905.

Aedes plutocraticus Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 11, 1907.

Aedes plutocraticus Theobald, Mon. Culic., v, 485, 1910.

Aedes plutocraticus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 804, 1917.

Aedes (Ochlerotatus) plutocraticus Dyar, Ins. Ins. Mens., vi, 77, 1918.

Aedes (Heteronycha) plutocraticus Dyar, Ins. Ins. Mens., viii, 105, 1920.

This is the form inhabiting the Bahamas. We have only the series collected by Dr. T. H. Coffin. The larva is still undescribed.

***Aedes tortilis bracteatus* Coquillett.**

Culex bracteatus Coquillett, Proc. Ent. Soc. Wash., vii, 184, 1906.

Aedes habanicus Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 198, 1906.

Ochlerotatus bracteatus Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 19, 1906.

Aedes bracteatus Pazos, Anal. Acad. Cien. méd., fis. y nat. de la Habana, xlv, 423, 1908.

Aedes bracteatus Pazos, San. y Ben., ii, 47, 320, 1909.

Culex bracteatus Theobald, Mon. Culic., v, 612, 1910.

Aedes bracteatus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 802, 1917.

Aedes (Ochlerotatus) bracteatus Dyar, Ins. Ins. Mens., vi, 77, 1918.

Aedes (Heteronycha) bracteatus Dyar, Ins. Ins. Mens., viii, 105, 1920.

This is the form inhabiting Cuba.

***Aedes tortilis balteatus* Dyar & Knab.**

Aedes balteatus Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 9, 1907.

Aedes balteatus Theobald, Mon. Culic., v, 485, 1910.

Aedes balteatus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 809, 1917.

Aedes (Ochlerotatus) balteatus Dyar, Ins. Ins. Mens., vi, 77, 1918.

Aedes (Heteronycha) balteatus Dyar, Ins. Ins. Mens., viii, 105, 1920.

This is the form inhabiting Santo Domingo.

***Aedes tortilis virginensis*, new subsepecies.**

Aedes sp., Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 804, 1917.

The above name may be applied to the single specimen from St. Thomas mentioned in the monograph. The mesonotum is broadly golden in the middle, widening sharply centrally, then roundedly retreating, the golden not reaching antescutellar space except narrowly in the center.

Type, female, No. 24898, U. S. Nat. Mus.; St. Thomas, Virgin Islands, August, 1905 (A. Busck).

SPECIES 4

***Aedes (Ochlerotatus) lynchii* Brèthes.**

Heteronycha dolosa Lynch Arribalzaga (in part, ♀), Rev. Mus. de la Plata, ii, 156, 1891.

Culex lynchii Brèthes, Ann. Mus. Nac. Hist. B. A., xxviii, 212, 1916.

Heteronycha dolosa Howard, Dyar & Knab (in part, ♀), Mosq. No. & Cent. Am. & W. I., iv, 613, 1917.

Culex tapinops Brèthes, Physis, iii, 227, 1917.

Aedes lynchii Dyar, Ins. Ins. Mens., vii, 87, 1919.

Aedes (Heteronycha) dolosa Dyar (in part), Ins. Ins. Mens., vii, 88, 1919.

Aedes (Heteronycha) dolosa Dyar (in part), Ins. Ins. Mens., viii, 105, 1920.

Aedes (Ochlerotatus) lynchii Dyar, Ins. Ins. Mens., ix, 149, 1921.

Much difficulty has arisen from Lynch's confused and erroneous account of his *Heteronycha dolosa*. It appears probable that he described from a male *Culex* and a female *Aedes*. Both of these were later redescribed by Brèthes, the *Culex* as *Culex bonariensis*, the *Aedes* as *Culex lynchii*. Theobald (Mon. Culic., ii, 151, 1901) placed *Heteronycha dolosa* as a synonym

of *Culex fatigans* Wied. (See also Mon. Culic., v, 383, 1910, where the reference is repeated). Blanchard makes the same reference (Les Moust., 353, 1905), copying Theobald. The synonymy is incorrect, as the male is not *fatigans* (= *quinquefasciatus* Say), but a distinct species of the *salinarius* group. However this is said to constitute a restriction of *Heteronycha* to the *Culex* element, and therefore Howard, Dyar and Knab were not at liberty to restrict *Heteronycha* to the *Aedes* element of Lynch, as in the reference cited from the monograph.

Brèthes described *lynchii* from females; but later he added to the confusion, by describing the supposed male of it, but his male was in reality a *Culex* (= *C. brethesi* Dyar). Consequently when he found the true male, he did not recognize it, and redescribed it under the name *tapinops*. By his excellent figure it is clear that the species belongs strictly to the *scapularis* group. I have also examined a male kindly sent by Dr. Juana Petrocchi.

The species is not uncommon in Argentina, presumably after specially heavy rains.

SPECIES 5

Aedes (*Ochlerotatus*) *crinifer* Theobald.

Culex crinifer Theobald, Mon. Culic., iii, 209, 1903.

Culex crinifer Peryassú, Os. Culic. do Brazil, 187, 1908.

Culex crinifer Theobald, Mon. Culic., v, 361, 1910.

Culex crinifer Surcouf & Gonzales-Rincones, Essai Dipt. vul. Venez., 181, 1911.

C(ulex) crinifer Lutz, Mem. Inst. Oswalddo Cruz, x, fasc., ii, 87, 1918.

Aedes (*Heteronycha*) *crinifer* Dyar, Ins. Ins. Mens., viii, 105, 1920.

Described from Brazil. I have a single male, by the kindness of Dr. Arthur Neiva, which shows the characteristic hypopygium of the *scapularis* group.

SPECIES 6

Aedes (*Ochlerotatus*) *scapularis* Rondani.

Culex scapularis Rondani, Studi ent., Baudi e Truqui, 109, 1848.

Ochlerotatus confirmatus Lynch Arribalzaga, Rev. Mus. de la Plata, ii, 146, 1891.

- Culex confirmatus* Giles, Handb. Gn. or Mosq., 320, 1900.
Culex confirmatus Theobald, Mon. Culic., ii, 42, 1901.
Culex confirmatus Giles, Handb. Gn. or Mosq., 2 ed., 443, 1902.
Culex confirmatus Taylor, Rev. Med. Trop., iv, 118, 1903.
Culex confirmatus Theobald, Mon. Culic., iii, 191, 1903.
Culex confirmatus Parker, Beyer & Pothier, Bull. 13, Yell. Fev. Inst., 40, 1903.
Culex confirmatus Lutz in Bourroul, Mosq. do Brazil 41, 72, 1904.
Culex confirmatus Pazos, Bull. Soc. Ent. France, 1904, 134, 1904.
Culex scapularis Blanchard, Les Moust., 335, 1905.
Culicada confirmatus Felt, Bull. 97, N. Y. Sta. Mus., 476, 1905.
Culex confirmatus Grabham, Can. Ent., xxxvii, 405, 1905.
Culex confirmatus Theobald, Gen. Ins., Dipt., 26 fasc., 26, 1905.
Culex confirmatus Theobald & Grabham, Mosq. or Culic. Jamaica, 25, 1905.
Culex confirmatus Goeldi (in part), Os. Mosq. no Pará, 93, 1905.
Aedes hemisurus Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 199, 1906.
Ochlerotatus confirmatus Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 19, 1906.
Aedes indolecens Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 11, 1907.
Culex scapularis Autran, Anal. Dep. Nac. Hig., xiv, 20, 1907.
Culex confirmatus Aiken, Brit. Guiana Med. Ann., 1906, 68, 1907.
Aedes hemisurus Pazos, Rev. de Med. Trop., Habana, i, 99, 1908.
Culex confirmatus Peryassú, Os. Culic. do Brazil, 188, 1908.
Aedes scapularis Pazos, Sán. y Ben., ii, 47, 322, 1909.
Leucomyia scapularis Theobald (in part), Mon. Culic., v, 315, 1910.
Aedes indolecens Theobald, Mon. Culic., v, 485, 1910.
Aedes scapularis Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 783, 1917.
Aedes (Ochlerotatus) scapularis Dyar, Ins. Ins. Mens., vi, 77, 1918.
Aedes (Ochlerotatus) camposanus Dyar, Ins. Ins. Mens., vi, 128, 1918.
Aedes (Heteronychia) scapularis Dyar, Ins. Ins. Mens., viii, 105, 1920.

The form *scapularis scapularis* ranges over the whole of South America and most of the Antilles. The more northern forms were separated as species in the monograph, but will be arranged here as subspecies. The differences in coloration are slight, and not always readily appreciable. There are small differences in the larvae. That of *scapularis* has the body

pilose, the comb-scales feathered. Coming northward, the form *euplocamus* has the skin smooth or minutely spiculate, the comb scales still feathered. Farther north, the form *infirmatus* has the body smooth, the comb scales with a central point differentiated. The larva of *condolescens* is still unknown.

***Aëdes scapularis euplocamus* Dyar & Knab.**

Aëdes euplocamus Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 199, 1906.

Aëdes euplocamus Dyar & Knab, Proc. Biol. Soc. Wash., xix, 162, 1906.

Aëdes euplocamus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 787, 1917.

Aëdes (Ochlerotatus) euplocamus Dyar, Ins. Ins. Mens., vi, 77, 1918.

Aëdes (Heteronycha) euplocamus Dyar, Ins. Ins. Mens., viii, 105, 1920.

From Mexico and Central America.

***Aëdes scapularis infirmatus* Dyar & Knab.**

Culiselsa confirmatus Dyar (not Lynch), Journ. N. Y. Ent. Soc., xiii, 186, 1905.

Aëdes infirmatus Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 197, 1906.

Aëdes infirmatus Dyar, U. S. Dept. Agr., Bur. Ent., Circ. 72, 5, 1906.

Aëdes infirmatus Thibault, Proc. Ent. Soc., Wash., xii, 18, 1910.

Aëdes infirmatus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 781, 1917.

Aëdes (Ochlerotatus) infirmatus Dyar, Ins. Ins. Mens., vi, 77, 1918.

Aëdes (Heteronycha) infirmatus Dyar, Ins. Ins. Mens., viii, 105, 1920.

From the Gulf coast of the United States to North Carolina.

***Aëdes scapularis condolescens* Dyar & Knab.**

Culex confirmatus Coffin, in Shattuck, The Bahama IIs., 282, 1905.

Ochlerotatus confirmatus Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 19, 1906.

Aëdes condolescens Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 11, 1907.

Aëdes condolescens Pazos, Anal. Acad. Cien. med., fis. y nat. de la Habana, xlv, 422, 1908.

Aedes condolezens Pazos, San. y Ben., ii, 47, 321, 1909.

Aedes condolezens Theobald, Mon. Culic., v, 485, 1910.

Aedes condolezens Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 789, 1917.

Aedes (Ochlerotatus) condolezens Dyar, Ins. Ins. Mens., vi, 77, 1918.

Aedes (Heteronycha) condolezens Dyar, Ins. Ins. Mens., viii, 105, 1920.

From Cuba and the Bahamas. Neither the male nor larva of this form has been described.

SPECIES 7

Aedes (Ochlerotatus) thelcter Dyar.

Aedes (Taeniorhynchus?) thelcter Dyar, Ins. Ins. Mens., vi, 129, 1918.

Aedes (Ochlerotatus) thelcter Dyar & Ludlow, The Military Surgeon, i, 62, 1922.

The original series of females has been supplemented by a male from Camp McAllen, Texas, August 28, 1921, which I have through the kindness of Dr. C. S. Ludlow. The hypopygium shows the characteristic claspette filament with double retrose spine. The male is marked as the female, but the abdominal spottings are small and faint.

TWO MOSQUITOES NEW TO THE MOUNTAINS OF CALIFORNIA

(*Diptera, Culicidae*)

BY HARRISON G. DYAR

The collecting season of 1921 resulted in the addition of two more species to the known fauna of the Californian mountains.

Culex territans Walker (*restuans* Theobald).

A single female was bred from an early grassy pool in a narrow mountain valley, which contained large numbers of *Aedes cataphylla* Dyar and a few *Aedes palustris* Dyar.

Little Truckee River, California, May 7, 1921 (H. G. Dyar).

Aedes impiger Walker (*decticus* Howard, Dyar & Knab). .

True to its habits in the Yukon Territory, this species was found associated with *Aedes cataphylla* Dyar (*prodotes* Dyar), in lesser numbers, occurring in the two large breeding-places discovered to the extent of about 10 per cent of the number.

Little Truckee River, California, May 7, 8, 9, 1921 (H. G. Dyar).

Lake Tahoe, California, May 7 to 12, 1921 (H. G. Dyar).

ILLUSTRATIONS OF THE MALE HYPOPYGIUM OF CERTAIN SABETHIDS

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

Sabethinus undosus Coquillett (Plate II, fig. 3).

Sabethoides undosus Coquillett, Proc. Ent. Soc. Wash., vii, 186, 1906.

Sabethinus intermedius Theobald (Mon. Culic., iv, 619, 1907) must be close to *undosus*, the brilliant apple-green of mesonotum, as described, agreeing perfectly. Theobald's unusually lucid reference to the male genitalia, "claspers ending in a broad plate with one side fimbriated," would seem almost decisive (compare fig. 3). However, I learn from Mr. F. W. Edwards that there is no trace of white on the under side of the fifth hind tarsal joint, which marking is present in *undosus*. Formerly we relied on the supposed presence of scales on the postnotum to distinguish this form, but Dr. and Mrs. Bonne say that there are no scales in any of the species in this position. *S. intermedius* has been credited to Lutz in Bourroul (1904), but no description is known to me before that of Theobald.

Sabethinus aurescens Theobald (Plate II, figs. 1, 2).

Sabethinus aurescens Theobald, Mon. Culic., iv, 622, 1907.

Sabethes identicus Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 207, 1907.

In the monograph we give what purports to be a figure of the male hypopygium of this form (Plate II, fig. 6), but a re-examination of the material shows that both this figure and

figure 4 represent *undosus*, the same species in different views. For this reason I could not separate *identicus* and *undosus* by the male genitalia when treating of these forms recently (Ins. Ins. Mens., vii, 119, 1919). The real structures are abundantly distinct as shown by the figures (Plate II, figs. 1, 2), where I have drawn the structures from two aspects. The stem of the clasper is long and slender, instead of short and thick; the long basal arm of *undosus* is represented by a shorter cone-shaped structure; the short side arm is wanting; the terminal fimbriated plate is carried up to the outer margin continuous with the terminal spines, the barred area being reduced to a scalloped edge.

Dr. and Mrs. Bonne examined a larval preparation of *aurescens* in the British Museum, which they found the same as *identicus*, thus fixing the synonymy beyond doubt.

Sabethes cyaneus Fabricius (Plate II, fig. 4).

Culex cyaneus Fabricius, Syst. Antliat., 35, 1805.

Sabethes locuples Robineau-Desvoidy, Mem. Soc. Hist. Nat. Paris, iii, 412, 1827.

Culex remipes Wiedemann, Ausser. Zweifl. Ins. i, 6, 1828.

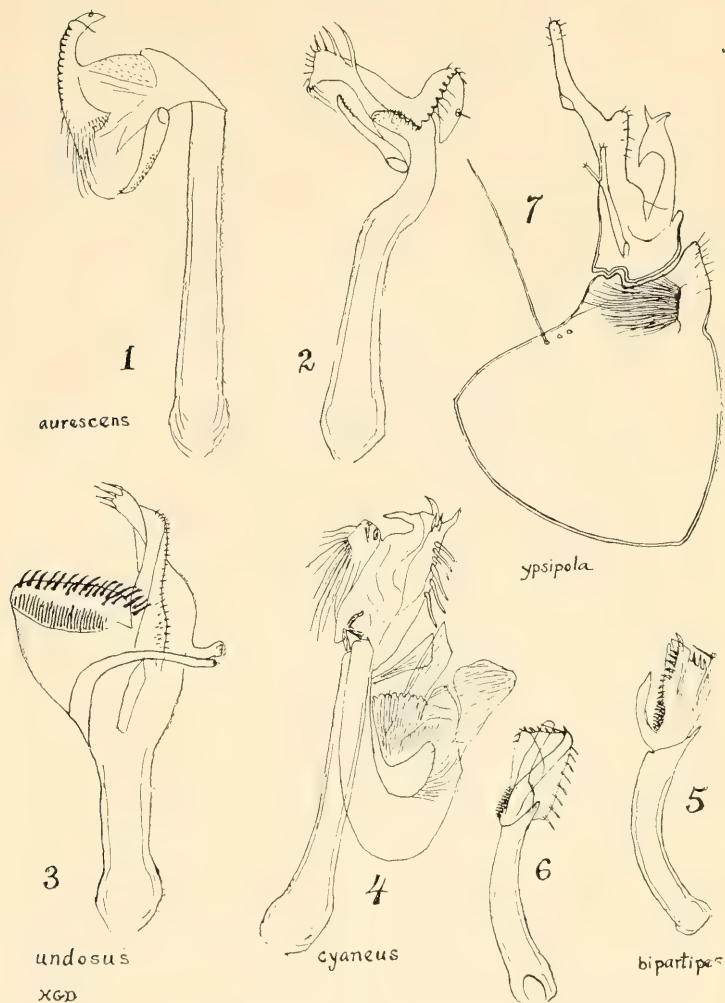
I have made a new sketch of the clasper (fig. 4), as I do not see the details in the same way as the artist did, and also for more ready comparison with the next species. The basal curved plate is enlarged and curiously subdivided; the head portion seems to me to represent a single mass, and not two lobes as shown in our figure. The complication of the structure is marked, but not in the direction of division into separate lobes.

Sabethes bipartipes Dyar & Knab (Plate II, figs. 5, 6).

Sabethes bipartipes Dyar & Knab, Proc. Biol. Soc. Wash., xix, 136, 1906.

Sabethes chroiopus Dyar & Knab, Ins. Ins. Mens., i, 76, 1913.

In this form the clasper is unexpectedly reduced. I show the structures from two points of view (figs. 5 and 6). There seem to be four plates, but they are similar and appressed. The marginal one (fig. 5) bears a long terminal transverse spine, and there is a dense area of fine spines on the opposite side at base. Other details appear in the figures.



EXPLANATION OF PLATE II

1. Clasper of *Sabethinus aurescens* Theobald.
2. The same in different aspect.
3. Clasper of *Sabethinus undosus* Coquillett.
4. Clasper of *Sabethes cyaneus* Fabricius.
5. Clasper of *Sabethes bipartipes* Dyar & Knab.
6. The same in different aspect.
7. Side-piece and clasper of *Wyeomyia* (*Shropshirea*) *ypsipola* Dyar.

THE OVIPOSITION OF *JOBLOTIA DIGITATUS* . RONDANI

(*Diptera, Culicidæ*)

By J. LENNOX PAWAN

Joblotia digitatus Rond. commonly deposits its egg in the rain water that accumulates in the broken cocoa pods strewn in heaps on the ground about the cool, shady parts of cocoa fields, in Trinidad, B. W. I.

The "parturient" female assumes a characteristic attitude upon the surface of the water. Her hind pair of legs lie extended backward to their maximum length and slightly outward. The front pair of legs are projected forward and outward, the femur forming almost a right angle with the tibia and the latter an obtuse angle with the tarsus which rests forward and outward. In both the front and hind legs the tarsi are the only parts in direct contact with the surface of the water. The position of the middle pair of legs is very definite; the femur is directed backward, the tibia is acutely flexed forward and the ankle joint embraces firmly the lateral borders of the egg mass, the tarsus projecting sharply backward and resting upon the surface of the water. The thorax, abdomen and head are raised above the water. While the cohesiveness of the egg mass is maintained through the clasp of her middle ankle joints, the weight and buoyancy of the eggs preserve her from being submerged during the process of oviposition. This process, which usually takes place in the morning, lasts from two to four hours, during which time she seems quite helpless, being unable and unwilling to take to her wings if disturbed, rendering herself an easy captive and giving one the impression of being in pain. After oviposition has ceased she continues to rest upon the surface of the water, often away from the egg mass for from two to three hours, then crawls to the sides of the containing receptacle and gladly wings a rapid flight away.

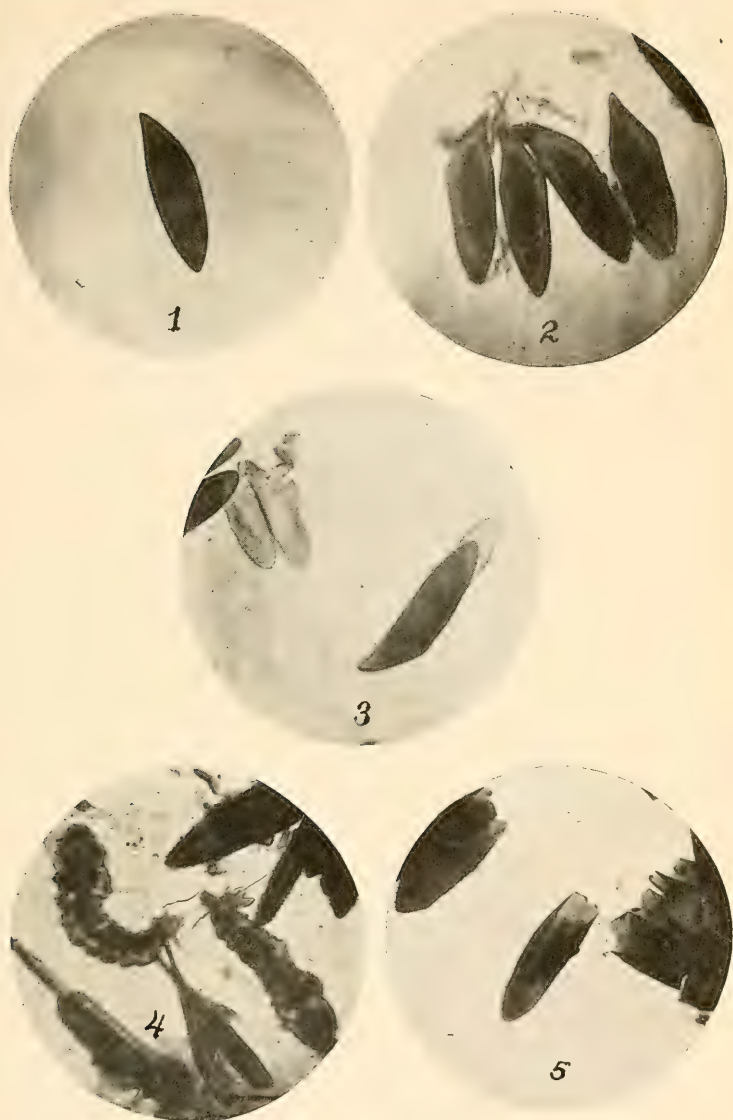
The eggs lie in circular or square-like masses, consisting of from 25 to 40 in number, floating with their long axes perpendicular to the surface of the water and glued together at their

broadest circumference by a gelatinous substance which helps to keep the mass afloat. A little less than one-third of its length lies submerged, the remaining portion being above the water. The eggs on escaping from the female are of a distinct grayish brown color, but in less than half an hour that portion which lies exposed to the air above the surface of the water assumes a dark steel blue appearance, the whole mass of individual eggs simulating a honey comb or a collection of gun shells resting on their bases.

To the naked eye an individual egg shows an ovoid shape elongated at both extremities with their broadest circumference immediately above the junction of the blue and brownish portions, the latter tapering rapidly with a sharp and distinct curve. The lower portion, which retains its color, is chitinous; the other, which lies above the water, is brittle and "calcareous."

Microscopically an egg is seen to consist of one portion a little less than one-third which lies submerged and which retains its brown color, and another portion which rests above the surface of the water over which there is a definite but loosely adherent capsule, studded with numerous translucent pedunculated and sessile tubercles, arranged in regular rows and containing air (Plate III, figs. 2, 3, 5). This investing capsule enfolds the underlying portion of egg and in the fresh preparation is seen to extend to the junction of its lower and middle third. It is, however, absent along a line running from below its apex to its base, leaving bare a space gradually increasing in extent from above downward and with its extremity curved on either side. Along this bare area the brown egg shell can be seen. The change in color from brownish to dark blue affects this capsule only and not the egg shell. Shorn of its capsule the underlying egg shell is seen to consist of a brownish outer layer made up of definite circular strands enclosing an inner thin delicate layer surrounding the yolk substance which bathes the larva cells and subsequently the larva. No operculum can be seen.

The larva hangs with its head downward in the floating egg and in from eight to ten hours after oviposition ruptures that



EXPLANATION OF PLATE III

1. Egg of *Joblotia digitatus* Rond.
2. A group of eggs, showing unhatched larvae within.
3. Eggs, with investing capsule detached.
4. Larvae, one minute after escape from egg.
5. Remains of egg after escape of larvae.

lower submerged portion and that longitudinal area of egg free from investing capsule to escape and wriggle freely to the depth of the water. The egg remains doubled upon itself with a wide gaping aperture along its longitudinal aspect, the margins of which are thrown into folds, and an irregularly torn vent at its submerged base (Plate III, fig. 5).

THE MOSQUITOES OF THE PALAEARCTIC AND NEARCTIC REGIONS

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

In the November, 1921, number of the "Bulletin of Entomological Research," Mr. F. W. Edwards gives a valuable review of our present knowledge of the palaeartic mosquitoes. The region included is far too extensive for a direct comparison with the North American fauna, as it extends to northern Africa and in the east to Japan; but by selecting those species inhabiting the region in Europe that corresponds to our Canadian region, the comparison becomes instructive. It appears that the palaeartic and nearctic faunae were continuous at a comparatively recent date. Some of the more stable species are identical, others are racial, others representative, and the rest are derivatives. There are no species proper to the fauna which have a diverse origin.

In some details it seems necessary to dissent from Mr. Edwards's conclusions. Exactly what degree of difference constitutes a species and what a geographical race or variety is more or less a matter of individual opinion. I think that where constant differences appear in any stage that specific rank is indicated, and treat the forms accordingly in the following.

Genus *Anopheles* Meigen

The only species occurring in our Canadian fauna is *occidentalis* D. & K. Mr. Edwards considers this the same as the European *maculipennis* Meig. He has considered the differen-

tial points indicated by me, and finds them insufficient for even racial separation. Apparently the former connection between the old and new worlds was by way of Alaska, and this species, inhabiting the west of America, has not differentiated itself in the two areas. The synonymy may presumably be accepted, as follows:

Anopheles maculipennis Meigen.

Anopheles maculipennis Meigen, Syst. Besch. Zweif. Ins., i, 11, 1818.

Anopheles occidentalis Dyar & Knab, Proc. Biol. Soc. Wash., xix, 159, 1906.

Anopheles lewisi Ludlow, Psyche, xxvii, 74, 1920.

Anopheles selengensis Ludlow, Psyche, xxvii, 77, 1920.

Our eastern *A. quadrimaculatus* Say is a distinct species, while our *A. barberi* has a representative species in the European *A. plumbeus* Steph. The distribution of both of the American species is distinctly more disconnected from the north than that of *A. maculipennis*, and the differentiation is correspondingly greater. Our species *A. walkeri* Theo. and *A. atropos* D. & K. are not referred to by Mr. Edwards, but are probably derivatives of the same stock. *A. crucians* Wied. and *A. punctipennis* Say may not be of holarctic origin.

Genus **Uranotaenia** Lynch A.

The species cited from the Mediterranean region and Japan are wholly unrelated to the North American forms, showing that this genus reached us from the south.

Genus **Culiseta** Felt

Only one of the species is common to the new and old worlds, *C. alaskaënsis* Ludlow, which has a western distribution with us. Edwards finds *siberiensis* Ludl. and *arctica* Edw. to be synonymous, and the distribution to include all of northern Asia and Europe, Siberia, Archangel, Sweden and Scotland, as well as the Alpine regions of Austria and Upper Silesia. A description of the larva was given by me (Ins. Ins. Mens., vii, 33, 1919).

The European *C. annulata* Schr. finds a representative with us in *C. maccrackenae* D. & K., and *C. glaphyroptera* Schin. in *C. impatiens* Walk. Our *C. incidens* Thom. seems to have no European representative, which is surprising, as *incidens* has both western and northern distribution and by the usual rule might be expected to occur intact in Europe. The isolation of *C. inornatus* Will. is more comprehensible, as this has a southern distribution with us and disappears toward the north, being thus well disconnected.

The subgenus *Culicella* has two representatives in Europe, only one with us, namely, *C. dyari* Coq., representing the European *C. morsitans* Theo.

Genus *Orthopodomyia* Theob.

Quite unexpectedly our single species has reached us from the north, *O. signifer* Coq. having a near representative in the European *O. pulchripalpis* Rond. The other known species have a tropical distribution, and the natural supposition would be that *O. signifer* came from the south. The opposite conclusion, however, is clearly indicated.

Genus *Mansonia* Blanch.

This case exactly parallels that of *Orthopodomyia*, our *M. perturbans* Walk. having a near European representative in *M. richiardii* Fic. The other *Mansonia* are of tropical distribution, and one of these forms has actually reached us in southern Florida, *M. titillans* Walk.

Genus *Aedes* Meigen

Taking the groups of the subgenus *Ochlerotatus* as defined by me (Ins. Ins. Mens., viii, 105-106, 1920), the *serratus* and *scapularis* groups are unrepresented in Europe, as befits their southern distribution and evident origin.

Group *pullatus*

This group appears remarkably stable, as three out of our four species are still existing unaltered in Europe. *A. aurifer* Coq. seems to have no European representative, and is probably

an American derivative, considerably altered from the ancestral type. *A. muelleri* Dyar, occurring in the mountains of Mexico, has genitalia of *pullatus* and coloration of *diantaeus*, a synthetic form. The following synonymy is given:

***Aëdes diantaeus* Howard, Dyar & Knab.**

Aëdes diantaeus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 758, 1917.

Aëdes serus Martini, Arch. f. Schiffs- u. Trop., xxiv, Beih. i, 96, 1920.

I have examined specimens of *serus*, received from Dr. Martini, and can confirm the synonymy. No difference is apparent in any stage between American and European examples.

***Aëdes pullatus* Coquillett.**

Culex pullatus Coquillett, Proc. Ent. Soc. Wash., vi, 168, 1904

Aëdes acrophilus Dyar, Ins. Ins. Mens., v, 127, 1917.

Culex jugorum Villeneuve, Bull. Soc. Ent. France, 1919, 58, 1919.

Aëdes metalepticus Dyar, Ins. Ins. Mens., viii, 51, 1920.

Aëdes gallii Martini, Arch. f. Schiffs- u. Trop., Beih. i, 110, 1920.

Edwards lists the European form as var. *jugorum*, but it appears to me that the characters cited are without especial value. The apparent stoutness of the claspette stem and basal spine vary with the preparation, while the whiteness of the mesonotal vestiture may be due to fading. I have seen old specimens of American *pullatus*, caught on the wing, which were almost as white as the specimens submitted to me by Prof. Bezzi. This species seems unusually subject to fading even during life.

***Aëdes intrudens* Dyar.**

Aëdes intrudens Dyar, Ins. Ins. Mens., vii, 23, 1919.

Mr. Edwards has seen a male of this species taken by H. Loew in 1844, presumably in the Posen district of Germany. The form must be very rare, for it has not reoccurred in recent European collections. Mr. Edwards states that he cannot distinguish this species by coloration from *pullatus* or *communis*; but this must be due to lack of familiarity with the insect.

The generally uniformly brown mesonotum separates it easily in my experience.

Group *punctor*

Edwards lists two species in Europe of this group, to both of which he cites American names. *Aedes punctor*, var. *meigenanus* Dyar represents our *punctor*, and *A. sticticus* Meig. represents the *hirsuteron* subgroup. To the latter *A. aldrichi* is cited as a synonym with a query. Unfortunately I have not seen any specimens of *sticticus*, and for this reason stated that the group was unrepresented in Europe (Ins. Ins. Mens., ix, 69, 1921). This statement is to be corrected; but I do not think that Mr. Edwards has established the identity of *sticticus* with any American species. It is doubtless a close representative, and appears to have the same habits. Eckstein is quoted as stating that the larvae occur in flooded meadows, together with *vexans* and *dorsalis*, and to pass through several generations during a year. With us, *dorsalis* does not occur in flood-water with the other species, but the habits of that are not here under discussion. The appearance of having several generations may be due to successive hatchings in different floods, an appearance often noted with us and commented on by me (Ins. Ins. Mens., v, 113, 1917). If *sticticus* is to replace any American name, it will be *hirsuteron* or *aestivalis*, and not *aldrichi*, which is a smaller form having the mesonotal stripe divided.

In regard to *punctor*, we have a number of very close species in America, from which the European form seems specifically detached. I am therefore not inclined to depart from my position previously discussed (Ins. Ins. Mens., ix, 72, 1921), and consider that the European form should be called *Aedes meigenanus*, and that *punctor* is its American representative.

Group *impiger* (*decticus*)

Under *Aedes communis* De Geer, Edwards gives *lazarensis* F. & Y. as an absolute synonym and *tahoënsis* Dyar and *pionips* Dyar as synonyms with a query. In regard to the former, I have examined mounts of the hypopygium of European speci-

mens and find the setae of the outer lobe of side-piece stouter than in the American form. The coloration is very similar. I am of opinion that the American form is a race of the European, and should be classified as *A. communis lazarensis*. I have already referred *tahoënsis* as a race, which may now stand *A. communis tahoënsis*. In regard to *pionips*, a distinct species is clearly involved, as the larval differences are striking. The species is larger, and though the markings are very similar, the habits differ, *pionips* appearing late in the season from river and lake-pools, whereas *lazarensis* and especially *tahoënsis*, hatches very early and can be found when the ground is still snow-covered.

Another representative of this group appears to be *detritus* Hal.; but this is a salt-water breeder and is entirely unrepresented in America.

Further there are two species representing *cataphylla* and *impiger*, the former called *cataphylla*, var. *rostochiensis* Mart. I have some examples of this by the kindness of Dr. Martini, and do not trace any resemblance in the thoracic markings to those of *cataphylla*, with which I am familiar by the personal collection of hundreds of examples. I therefore think that the species should be *A. rostochiensis* Mart., representing our *cataphylla* in Europe, but specifically distinct. In regard to *impiger*, *salinellus* Edw. is its European representative, as Mr. Edwards himself states.

Our desert form, *niphadopsis* D. & K., may be represented in Europe by *A. albescens* Edw. from West Siberia, known only in the female.

Group *curriei*

There are a number of species of this group in Europe, two of which (*pulchritarsis* Rond. and the recently described *berlandi* Séguy) contradict the genitalic character I gave for the group by having a spine on the basal lobe of side-piece. Of the group, one seems certainly common to both continents. The following synonymy will therefore replace one of our familiar names:

Aëdes dorsalis Meigen.

- Culex dorsalis* Meigen, Syst. Besch. Zweifl. Ins., vi, 242, 1830.
Culex maculiventris Macquart, Dipt. Exot., Suppl. i, 7, 1846.
Culex curriei Coquillett, Can. Ent., xxxiii, 259, 1901.
Culex onondagensis Felt, Bull. 79, N. Y. Sta. Mus., 278, 1904.
Aëdes quaylei Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 191, 1906.
Culex lativittatus Coquillett, Ent. News, xvii, 109, 1906.
Grabhamia mediolineata Ludlow, Can. Ent., xxxix, 129, 1907.
Grabhamia broquettii Theobald, Entom., xlvi, 179, 1913.
Aëdes grahami Ludlow, Ins. Ins. Mens., vii, 154, 1920.

There is in Europe another species, *A. caspius* Pall., closely allied to *dorsalis*, but unrepresented in America. Our own species allied to *dorsalis*, *campestris* D. & K., differs markedly in the genitalia. There seems to be no close representative of our *canadensis* Theo. in Europe, either. It seems rather curious that our *curriei* should be identical when all the others differ, but all stages have been examined carefully without any differences becoming apparent. It is to be noted, however, that the habits of the European *dorsalis* are not the same as those of our *curriei*, since the former is said by Eckstein to breed in flood-water with *sticticus* and *vexans*, which *curriei* never does.

Group *stimulans*

The relationship of these forms is obvious and interesting. I can make but one species common to both Europe and America, by which another of our familiar names disappears, as follows:

Aëdes flavescens Müller.

- Culex flavescens* Müller, Faun. Ins. Friedrichdalina, 87, 1764.
Culex lutescens Fabricius, Syst. Ent., 800, 1775.
Culex variegatus Schrank, Enum. Ins. Austr., 482, 1781.
Culex bipunctatus Robineau-Desvoidy, Mém. Soc. Nat. Hist. Paris, iii, 405, 1827.
Culex flavus Motchulsky, Bull. Soc. Imp. Nat. Mosc., xxxii, 503, 1859.
Culex arcanus Blanchard, Les Moust., 303, 1905.
Culex fletcheri Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 20, 1906.
Aëdes cyprinus Ludlow, Ins. Ins. Mens., vii, 158, 1920.

Mr. Edwards queries *flavescens*, *variegatus* and *bipunctatus*; but I am in favor of arbitrarily assigning these old unrecognizable names to the species to which they most probably belong, as was done in the case of some of Walker's types which were indefinite. I have therefore removed the queries, and call the species *flavescens* instead of *lutescens*.

This seems to be the most ancestral form of the group, and I can detect no difference in coloration, male genital structure or larvae between American and European specimens.

The European *maculatus* Meig. is closely represented by our *riparius* D. & K., but the structures are distinctly degenerated in the American form. The European *semicantans* Mart., with *freyi* Edw., which I do not know, forms the basis of our *fitchii* forms. I think that *lesnei* Séguy is the same as either *semicantans* or *freyi*, and not a synonym of the black-legged *sticticus* Meig. as Edwards doubtfully refers it. Our *stimulans* Walk. and *cantator* Coq. appear to represent a development of the ancestral *flavescens* form, in the direction of degeneration, and the type is apparently not represented in Europe.

The *excrucians* series is represented by two species, *annulipes* Meig., which we have nothing like, and a species which Edwards calls *excrucians*, citing *surcoufi* Theo. as a doubtful synonym. The male structures are indeed much like the American *excrucians*; but the larvae, which I have from Dr. Martini, differ distinctly, the air-tube not being drawn out as in our form and without any detached teeth to the pecten. I consider the European form distinct, and if it be shown that the name *surcoufi* Theo. does not apply, a new name will be required. It appears that the male type of *surcoufi* is lost; but males from the type locality may settle the question.

These remarks are based on Dr. Martini's material. I am aware that Wesenberg-Lund figures the larva of what he calls *excrucians* with a drawn-out tube and at least one detached pecten-tooth. Since it is possible that the drawings may be a little exaggerated, it may not be necessary to suppose that two species are involved, and yet that may be the case. Further investigation would do no harm.

There is no such peculiar development in Europe of the *maculatus-fitchii* series as gives rise to our species *grossbecki* D. & K. and *squamiger* Coq. The southern distribution of these is significant of long separation.

Group *thibaulti*

Unrepresented in Europe. Again note the southern distribution of our species.

Group *trichurus*

The European representative is *A. rusticus* Rossi. The relationship is very obvious, but not very close. In this case the American form is the more primitive of the two, *trichurus* not showing the peculiar development of the hairs of the basal lobe of the side-piece which are so marked in *rusticus*.

The peculiar *A. lepidonotus* Edw., with scales on the post-notum, is unrepresented with us.

Group *innuitus*

Mr. Edwards places both *innuitus* and *nearcticus* as synonyms of *alpinus*; but he recognizes also another species, which he names *parvulus*. A reëxamination of my material convinces me that these two species are both circumpolar, occurring together, with the following synonymy:

Aëdes alpinus Linnaeus.

Culex alpinus Linnaeus, Flora Lapp., ed. 2, 381, 1792.

Culex nigripes Zetterstedt, Ins. Lapp., 807 1838.

Aëdes innuitus Dyar & Knab, Ins. Ins. Mens., v, 166, 1917.

Aëdes n. sp. Dyar, Rep. Can. Arc. Exp., iii, Pt. C, 33, 1919.

Ochlerotatus nigripes Wesenberg-Lund, Mem. Acad. Roy. Sci. & Lett. Danemark (8), viii, pl. ix, 1921.

As stated by Edwards, the male hypopygium is heavily chitinized, the aedoeagus looking like a pair of strong forceps; the apical lobe is very small; the claspette-filament has a single narrow membranous expansion. The basal lobe is commonly furnished with even, long hairs, thickening progressively toward the margin, in some specimens the last one or two forming moderately strong spines. The larva has the anal segment ringed, the pecten of the air-tube with detached teeth. The

adult is larger, with more white scales on the legs, and somewhat more hairy body.

Aëdes nearcticus Dyar.

Aëdes nearcticus Dyar, Rep. Can. Arc. Exp., iii, Pt. C, 32, 1919.

Aëdes (Ochlerotatus) parvulus Edwards, Bull. Ent. Res., xii, 314, 1921.

The male hypopygium is not heavily chitinized, the aedoeagus inconspicuous; the apical lobe is larger; the claspette-filament has a broader membranous expansion, roundedly angled in the middle. The basal lobe is as in *alpinus*, without or more rarely with a marginal spine. The larva has the anal segment with dorsal plate, the air-tube with evenly spaced teeth. The adult is smaller, with less white scales on the legs, and somewhat less hairy body.

My Greenland material consists entirely of *alpinus*; but both species occurred together in the collections from the Canadian Northwest Territories and arctic Alaska.

The species of the subgenus *Finlaya* are rather numerous in Edwards's list on account of the extent given to his faunal region. The species *A. geniculatus* Oliv. represents our *A. triseriatus* Say, and like it, breeds in tree-holes.

The subgenera *Ecculex* Felt and *Aëdes* Meig. contain the species *vexans* Meig. and *cinereus* Meig., already known to be common to Europe and America.

The subgenus *Stegomyia* contains four species, all of oriental origin. One, *A. aegypti* Linn., occurs with us, but by way of tropical importation only.

Genus Culex Linnaeus

Edwards places my subgenus *Neoculex* as synonymous with *Culex* proper, stating that intermediate forms occur. Three species are made common to Europe and America, two by commerce as already well known, the third by way of the holarctic fauna. Edwards calls this species *apicalis* Adams, but I refer to my previous discussion of *testaceus* van der Wulp (Ins. Ins. Mens., vii, 36, 1919). I am since informed that the male type has lost the abdomen. It therefore becomes indefinite and I

would restrict this name to the present species, with which all the characters that can be ascertained agree. Edwards adds to my synonymy the following references:

Culex sergenti Theobald, Mon. Culic., iii, 218, 1903.

Culex pyrenaicus Brolemann, Ann. Soc. Ent. France, lxxxvii, 427, 1919.

In regard to *C. pipiens*, the interesting observation is made that the Californian form *comitatus* D. & K. is identical with the forms *pallens* Coq. from Japan, and that the species was introduced to our west coast from Japan. The eastern *pipiens*, being introduced from Europe, shows the normal type of structure.

Besides the synonymy indicated, Edwards has introduced a number of new characters for generic definition, which will be of great value.

FOUR UNDESCRIBED SPECIES OF LIMNOBIA FROM THE ORIENTAL REGION

(Diptera, Tipulidæ)

By CHARLES P. ALEXANDER

The high mountains of the Oriental Region support a rich fauna of crane-flies of the tribe Limnobiini. The four undescribed species of *Limnobia* (*Limonia*) were included in material sent to me by Mr. J. B. Corporaal, collected in Sumatra, and by Mr. Teiso Esaki, collected in Formosa or Taiwan. The author's thanks are extended to the collectors of this material for the privilege of retaining the types.

***Limnobia megastigma*, new species.**

General coloration yellow; antennal scape yellow, the flagellum black; mesonotal praescutum with four brown stripes; femora brown with an obscure yellow subterminal ring, the tips black; wings yellow, the stigma very large, brownish black; *r* at tip of *R*₁.

Male.—Length, 9 mm.; wing, 11.2 mm.

Rostrum and palpi black. Antennae with the scape obscure yellow; flagellum black. Head discolored in the type, apparently obscure yellow.

Mesothorax unusually gibbous. Mesonotal praescutum shiny yellow with four conspicuous black stripes, the intermediate pair narrowly connected before the suture; scutal lobes darkened laterally; remainder of mesonotum obscure yellow. Pleura obscure yellow. Halteres with the basal two-thirds of the stem obscure yellow, the remainder brownish black. Legs with the coxae and trochanters yellow; femora brown, the tips broadly black; a conspicuous, obscure yellow subterminal ring, slightly more extensive than the black femoral tip; tibiae black, the base a little paler; tarsi black. Wings with the apex obtuse; general coloration yellow, the base and costal region bright yellow; stigma very large, brownish black, occupying the entire area between the end of R_s and r ; a small brown spot at origin of R_s ; indistinct brown seams along the cord and outer end of cell 1st M_2 ; a more conspicuous brown seam along R_2+3 beyond the stigma; all longitudinal veins very faintly seamed with brown; veins brownish black. Venation: Sc_2 at the extreme tip of Sc_1 and exactly opposite the end of R_s ; R_s strongly angulated at origin; r at extreme tip of R_1 , strongly arcuate; veins R_2+3 and R_4+5 bent strongly caudad beyond midlength; basal deflection of Cu_1 immediately before the fork of M .

Abdominal tergites orange-yellow, each with a broad, brown median triangle; sternites obscure brownish yellow. Hypopygium bright yellow.

Habitat.—Sumatra.

Holotype, ♂, Brastagi, altitude 4,250 feet, May 15, 1921 (J. B. Corporaal).

***Limnobia flavoterminalis*, new species.**

General coloration yellow; praescutum without distinct markings; scutal lobes infuscated; knobs of halteres yellow; femora yellow with a conspicuous dark brown ring, the tips broadly yellow; wings yellow, marbled with brown; Sc long; abdominal tergites dark brown, the sternites obscure yellow.

Male.—Length, 7 mm.; wing, 8 mm.

Rostrum and palpi black. Antennae with the first segment of the scape black; remainder of antenna broken. Head dark brown.

Pronotum yellow. Mesonotal praescutum yellow without distinct darker markings, near the suture with a faint infuscation in the region occupied by the usual interspaces; scutum yellow, the centers of the lobes dark brown; scutellum yellow, margined with dark brown; postnotum with the median sclerite brown in center, fading into obscure yellow laterally. Pleura yellow with a very ill-defined, longitudinal, brown stripe. Halteres pale, the knobs light yellow. Legs with the coxae and trochanters greenish yellow; femora brownish yellow with a narrow but conspicuous, dark brown ring that is a little more than one-half as wide as the yellow tips; tibiae dark brown, the bases very narrowly obscure yellow; tarsi dark brown. Wings yellow, the costal region more saturated; wing-membrane extensively marbled with brown, this appearing as five ill-defined fasciae; the first fascia lies in the bases of cells *R* and *M*; second fascia near mid-length of cell *R*, extending across cells *R*, *M* and less clearly in *Cu* and the anal cells; third fascia broad, extending from the origin of *Rs*, along the sector to the end of *Sc*₁, continued caudad along the cord and less distinctly across the distal third of cells *R*, *M* and the end of cell *Cu*; the fourth fascia includes the small stigma at *r* and a broad seam along the outer end of cell 1st *M*₂; the terminal fascia occupies the wing-tip; anal cells pale brown with cream-colored spots; anal angle pale; veins brown, more yellowish in the pale areas. Venation: *Sc* very long, *Sc*₁ ending just before the end of *Rs*, *Sc*₂ about five times as long as *Sc*₁, ending some distance beyond the end of *Rs*; *Rs* arcuated; *r* a little less than twice its length from the tip of *R*₁; cell 1st *M*₂ elongate, widened distally; *m* arcuated, about three-fourths the outer deflection of *M*₃; basal deflection of *Cu*₁ at the fork of *M*.

Abdominal tergites dark brown, the sternites obscure yellow; hypopygium obscure brownish yellow.

Habitat.—Formosa.

Holotype, ♂, Tattaka, altitude about 7,400 feet, August 17, 1921 (T. Esaki).

Limnobia esakii, new species.

General coloration yellow; mesonotal praescutum with a single dark brown stripe; femora black with a conspicuous, subterminal yellow ring; wings yellow, spotted and clouded with brown; *Sc* short, ending a short distance beyond the origin of *Rs*; abdominal tergites brown, the sternites yellow, ringed caudally with brown.

Female.—Length, 8 mm.; wing, 7.2 mm.

Rostrum and palpi black. Antennae black, the apex of the second scapal and base of the first flagellar segment indistinctly paler; antennae longer than usual in this genus. Head dark brown, the anterior part of the vertex with an appressed gray pubescence.

Pronotum dark brown. Mesonotal praescutum yellow with a broad, brown, median stripe that widens at the suture; scutum dark brown, the median area pale; scutellum dark brown, the anterior margin with a pale median spot; postnotum dark brown. Pleura yellow. Halteres brown, the base of the stem obscure yellow. Legs with the coxae and trochanters yellow; femora brownish black, very indistinctly paler at base; a conspicuous, subterminal yellow ring that is a little wider than the black apex; tibiae black, the extreme base indistinctly pale; tarsi black. Wings tinged with yellow, more saturated basally and on the cephalic portion; a conspicuous, pale brown pattern, arranged as follows: A large blotch near midlength of cell *R*; a conspicuous blotch at the fork of *Rs*, connected along $R_2 +_3$ with the stigmal blotch; cord and outer end of cell 1st M_2 narrowly seamed with brown; stigma large, brown; small but darker brown spots at tip of *Sc* and origin of *Rs*; wing-apex faintly infuscated, this including the distal half of cell 2nd R_1 , R_3 , the distal two-thirds of R_5 and most of cells 2nd M_2 and M_3 ; a brown cloud along vein *Cu*; veins brown, *Sc* more yellowish. Venation: *Sc* short, Sc_1 ending just beyond the origin of *Rs*, Sc_2 at the tip of Sc_1 ; *Rs* short, strongly

angulated at origin; r more than twice its length from the tip of R_1 ; deflection of R_4+5 arcuated; cell 1st M_2 closed, relatively small; basal deflection of Cu_1 before the fork of M .

Abdominal tergites dark brown; sternites yellow, the segments narrowly ringed caudally with dark brown. Ovipositor with the tergal valves very long and slender, straight.

Habitat.—Formosa.

Holotype, ♀, Tattaka, altitude about 7,400 feet, August 17, 1921 (T. Esaki).

This interesting *Limnobia* is dedicated to the collector who has secured many undescribed species of Tipulidae in the mountains of Formosa.

Limnobia viridula, new species.

General coloration light green; antennal scape dark brown, the flagellum pale brownish testaceous; vertex between the eyes silvery white; pronotum and anterior margin of praescutum with a narrow brown, median stripe; legs brown; wings subhyaline, stigma small.

Male.—Length, 6.8 mm.; wing, 8.6 mm.

Rostrum and palpi dark brown. Antennae with the scape dark brown, the flagellum conspicuously pale brownish testaceous. Head dark brown, the vertex between the eyes conspicuous silvery white.

Pronotum light green with a narrow brown median stripe. Mesonotum light green, the cephalic portion of the praescutum with indications of a brown median stripe. Pleura light green. Halteres pale, the knobs infuscated. Legs with the coxae and trochanters pale green; remainder of the legs brown, the femoral bases a little paler. Wings subhyaline; stigma small, circular, pale brown; veins brown. Venation: Sc_1 ending nearly opposite $r-m$; Rs arcuated; r at tip of R_1 ; cell 1st M_2 rectangular; veins beyond the cord long and parallel as in the genus *Libnotes*; basal deflection of Cu_1 just before the fork of M .

Abdomen light green, including the hypopygium; pleural membrane faintly infuscated. Male hypopygium with the

dorsal pleural appendage small; ventral pleural appendage large, the rostriform lobes bearing a single acute spine.

Habitat.—Formosa.

Holotype, ♂, Urai, altitude about 1,500 feet, October 2, 1921 (T. Esaki).

THE MOSQUITOES OF THE GLACIER NATIONAL PARK, MONTANA

(*Diptera, Culicidæ*)

By HARRISON G. DYAR

The Glacier National Park occupies the crest of the Rocky Mountain Range, including the Continental Divide. The altitude of the range is not great; but the mountain masses, traversing an otherwise arid region, carry the Canadian fauna southward, almost in its entirety. On the west, the approach is gradual, the forested area reaching to the region about Whitefish Lake; but in the east, owing to the abrupt faulting of the geological formation known as the Lewis Overthrust, the transition to the bare prairie is sudden. The railroad follows the middle fork of the Flathead River and tributary creeks, and approaching from the west the change at the summit is abrupt and startling. The forest carpet is suddenly broken. Wide reaches of prairie appear, and when one arrives at the Glacier Park station, the mountains are behind, and the open prairie is about. The forest is seen in little patches hanging precariously to the higher slopes and huddled in narrow strips in the river valleys as these reach out into the plains.

In a former paper (*Ins. Ins. Mens.*, v, 104-121, 1917), I listed the mosquitoes to be found on the plains of Montana. The present forms a supplement to that, and adds the species of the mountains of the State. On reaching the prairie, the appropriate mosquitoes do not at once appear. There is a mosquito-less area of perhaps some fifty miles before the accustomed forms appear in their habitual abundance. No doubt there is an occasional migration. In fact a specimen of *Aedes*

nigromaculis, the dominant prairie form, was taken at Belton, well in the forested area; but in general this statement holds true. Further east on the plains mosquitoes appeared, in places in great abundance, following unusually heavy rains. It appears, therefore, that this is a permanent condition, and not due to temporary dryness of the region adjoining the mountains, for this area was not unduly dry.

Of the species comprising the Canadian fauna, only one, *Aedes punctor* Kirby, is absent. This absence is worthy of note, for *punctor* is one of the dominant and characteristic species of the fauna proper. However, in the Rocky Mountain region it appears to have dropped out completely. Certain large individuals of *lazarensis* with fused mesonotal bands raised a doubt at times, but there was nothing among the many hundreds of specimens taken that could be positively identified as *punctor*. The dominant species of the black-legged group is *lazarensis*. It occurs everywhere in forest, abundantly on the west of the divide, and east also, following down the river valleys as far as there are any trees. The variation in coloration is, as usual, considerable; but what makes identification a trial to the nerves is the occurrence of natural hybridization. Many of the specimens looked to me like hybrids when captured; but it was only on careful examination that the fact became apparent with the mounting of two hybrid males, *intrudens* x *lazarensis*. These hybrids had an abnormal appearance, but from the coloration before mounting, I took them to be a cross between *cataphylla* and *pullatus*. Neither of these species, however, proved to be involved. These hybrids occurred in the greatest abundance in the deep forest far from habitation. At Belton, on the railroad, the phenomenon was not noted, nor at the town of Whitefish, where large areas of the forest have been cut over. But by the kindness of the Superintendent of the Park, Mr. J. Ross Eakin, we were enabled to visit a remote locality, some twelve miles to the northwest of Lake McDonald. Here more hybrids were encountered than at any other place. Some also were taken to the east of the divide, the males in question within a few miles of

the town of Glacier Park. The habits of these males were abnormal, as they were taken resting in grass, which is never the case with either of the parent species. The only males found were *intrudens* x *lazarensis*; but from the appearance of the females, *cataphylla* x *lazarensis*, *pullatus* x *lazarensis* and even *cataphylla* x *pullatus* occurs.

These hybrids had the appearance of first crosses, and perhaps do not persist. If they do, we might as well revert to the old appellation of "the mosquito" and let the species go.

Aedes cataphylla is rare in the forested region west of the divide, but occurs. In the open spaces near forest east of the divide it becomes more abundant.

Of the species with ringed legs, *excrucians* and *fitchii* occur in the forests west of the divide, as is normal for the fauna, and also extend through in wooded patches to the east. The majority of the specimens to the east, however, consists of *mutatus*, the three forms here in usual association. Many females with speckled wings were taken about Glacier Park Station, which should be *fitchii mimesis*; but no males were secured to prove the identification, and it may be that the range of variation of *mutatus* has been underestimated. No males were taken belonging to the *stimulans* series, so it is not known whether one of these occurs also.

In detail the occurrence was as follows:

Aedes punctor Kirby.

Apparently does not occur.

Aedes aestivalis Dyar.

Not uncommon in the forest to the west of the divide, preferring open spaces. This species breeds in the flood-water particularly of lakes. No larvae were obtained in the National Park, as the season was too far advanced by the time we reached there, and the flood-pools had drained themselves. Larvae were obtained, however, at Sandpoint, Idaho. The larva was previously known in only a single example, bred from eggs secured at Kaslo, British Columbia, in 1903. This larva had single head-hairs, but must have been an aberrant example.

as the Sandpoint larvae had the upper hairs in threes, the lower in twos, with very considerable variation. Thus the supposed differences between this larva and that of *hirsuteron* Theob. disappear. I compared these larvae with *hirsuteron* larvae obtained at Hartford, Connecticut, and cannot find any differences. The lateral hair of the sixth abdominal segment is commonly single in both, though occasionally it is double. The skin in both is armed with rather long, sparse spicules. It appears, therefore, that *aestivalis* cannot be more than a race of *hirsuteron*, if not a pure synonym, there being no difference in larva, male hypopygium or adult coloration. The only remaining difference is a slight one of habit, *aestivalis* being found in the vicinity of lakes, while *hirsuteron* frequents the flood-pools in river valleys.

On the other hand, in regard to the nearly related *aldrichi* D. & K., which frequents river flood-pools in the west, certain differences are apparent in the larvae. Larvae of *aldrichi* were obtained in a river overflow of wooded bottom-land at Rexford, Montana. The larva has been mentioned by Mr. E. Hearle (Can. Ent., liii, 48, 1921). The lateral hairs of the sixth abdominal segment are always single; the skin is without the little spines, these spicules being very minute, the appearance more granular than spiculate. In addition the air-tube of *aldrichi* is somewhat shorter and the pecten runs a little further out, reaching just beyond the middle; the teeth of the lateral comb of the eighth segment have a sharp central thorn, with distinctly less lateral fringes than in *aestivalis* and *hirsuteron*. The adult of *aldrichi* is smaller, and has the mesonotal dark band divided. Rarely this band is united, and in *aestivalis* there is occasionally a trace of division; but this variation is not more than is common in mosquitoes.

Mr. F. W. Edwards has made *aldrichi* a synonym of the European *sticticus* Meigen (Bull. Ent. Res., xii, 312, 1921); but I think this is an error. From the descriptions (I am personally unacquainted with the European form) the species might be *hirsuteron*, and if this species is really common to

America and Europe, there would be less hesitation in making the synonymy *aestivalis* = *hirsuteron*.

New data on the distribution of these forms are at hand. When passing through Montana in 1917, the Yellowstone Valley was followed, and only *aldrichi* was met with in the river bottoms. I did not know *hirsuteron* from west of Minnesota, and therefore the distribution of *aestivalis* seemed considerably detached, occurring as it did only on the west of the Continental Divide. However, the past season the valley of the Missouri was followed. Here *hirsuteron* occurred in Minnesota in East Grand Forks, and across the river in Grand Forks, North Dakota. Without the larva it is not possible to be certain, but westward the specimens from Poplar and Glasgow, Montana, seemed to be still *hirsuteron* rather than *aldrichi*, for, though sometimes small, the mesonotal band is quite solidified. Still further west, at Havre, Montana, the species seemed to be the same. There is therefore no very great gap between *hirsuteron* and *aestivalis*, which occurs as far to the east as Belton, Montana.

These forms are, of course, all closely allied at the best. It seems that *hirsuteron* is the stem form, with *aestivalis* doubtless the same, and perhaps both equal the European *sticticus*. *Aldrichi* is a close derivative, adapted also to the flood-waters, but intensified in habit, for it occurs in the great flood-waters where the western rivers overflow wide territory, while *hirsuteron* does not occur here, but in smaller floods. The differentiation is hard to apprehend, but there seems to be undoubtedly a differentiation, for the two species do not generally occur together. From *hirsuteron* is derived *idahoensis*, inhabiting the dry open tree-less portions of the river valleys, and breeding in early spring pools. From *idahoensis* comes *spenceri*, frequently the open grassy prairies and wholly detached from the river valleys.

Spenceri has been, from previous records, strictly a Canadian species; but it occurred to us not uncommonly in half a dozen places in North Dakota and in western Minnesota.

Aedes communis lazarensis Felt & Young.

The most common species of the black-legged group. East of the divide many normally colored but small examples occurred, but in the forests to the west, the mesonotum was often dark brown or gray and variably ornamented. Great confusion also was caused by the numerous hybrids, as previously noted.

Aedes pionips Dyar.

No adults were taken, as we left the park early in July before the species was on the wing. Two large breeding pools, however, were found, one at the outlet of Lake McDonald, the other in the trail along the margin of Two Medicine Lake. The former culture was successful and many adults emerged; but the latter was almost totally destroyed by great numbers of *Eucorthera underwoodi* larvae, whose pupae occurred more abundantly in this puddle than I ever saw them before.

Aedes cataphylla Dyar (*prodotes* Dyar).

Frequenting open spaces near forest, and consequently rare to the west of the divide; rather common along the eastern base of the mountains, but not extending into the prairie. The species had been long on the wing by the first of July, and many examples were worn. Hybrids between this and *lazarensis* are indicated by the coloration of certain females; but it may be that these are aberrant forms of *impiger*, as no males were obtained of the apparently crossed forms.

Aedes impiger Walker (*decticus* H., D. & K.).

This occurred very rarely, but throughout the forest.

Aedes diantaeus Howard, Dyar & Knab.

Occurring in the most shaded and cool parts of the forest, absent elsewhere. A lovely place was found about two miles from the town of Whitefish where this species was, and again in low land where McDonald Creek empties into the Flathead River, this latter place having been kindly described to us by Mr. Eakin, who sent a boy to show the way. Mrs. Dyar, who was with me, saw a pair of mosquitoes in copulation on my coat-

sleeve, but they escaped capture. She was wielding the bottle at the time and hesitated through surprise. She "could hardly believe her eyes" as she said, for we were not expecting *diantaens*.

Aëdes intrudens Dyar.

Throughout the forest in dark woods, but not quite so particular as to location as *diantacus*. The hybrids between this and *lazarensis* perhaps deserve detailed mention. In the male hypopygium the apical lobe is strongly hairy outwardly as in *lazarensis*, not weakly so inwardly as in *intrudens*. Apical hair-tuft of *intrudens* wanting, though the inner margin of the whole lobe is unusually hairy. Basal lobe with the two spines on a pedicel of *intrudens*, but they are lengthened, flattened and irregular. The spine on one side is large, but there is some rugosity between these spines suggestive of the *lazarensis* lobe. Claspette angled and with basal hairy part as in *intrudens*, but the angulation is less sharp, there is no prominence or stout seta. Filament broader than in *lazarensis*, longer than in *intrudens*, with only a trace of the internal vacuolations of *intrudens*.

Aëdes pullatus Coquillett.

Rather rare, but occurring throughout the forest. Much variation was noted, and it is supposed that some of the specimens are hybrids with *lazarensis* and others with *cataphylla*, but no males of these mixed forms were obtained.

Aëdes trichurus Dyar.

This large and interesting species was a feature of the forest on the west of the divide, but no specimens came through to the east, even high in the range. I am inclined to think that this is specifically distinct from the eastern *cinereoborealis* F. & Y., but unfortunately the male remains unknown.

Aëdes cinereus Meigen.

A male was taken near the town of Whitefish, and the species doubtless exists sparingly throughout the forest.

***Aedes excrucians* Walker.**

Not common, but generally distributed in the forest proper to the Canadian zone. A male was demonstrated from Whitefish and another from the foot of the Mt. Henry trail, not far from the Glacier Park Hotel east of the divide.

***Aedes fitchii* Felt & Young.**

Very common in the forest. Vast swarms of the males were seen at Belton after sunset on a hillside between openings in the trees. We caught them with a net till we were tired of the sport. The species seems also to occur commonly east of the divide, or perhaps the form *mimesis*, but no males were taken.

***Aedes increpitus mutatus* Dyar.**

Very abundant in the river valleys to the east of the divide. We observed great swarms of the males. The swarming began before sunset. One evening, following a road back from the Glacier Park Hotel, we came to a place where the road dipped into a creek-bottom lined with willows. The males were flying close to the ground in hollows, banks and near bushes, just out of reach of the last rays of the setting sun. Later the swarms were seen higher up among the willows in the river-bottom.

***Aedes nigromaculis* Ludlow.**

This species belongs to the prairie fauna. A single stray example was taken at Belton.

***Aedes canadensis* Theobald.**

Scarce, but throughout the lower forest to the west of the divide.

***Aedes vexans* Meigen.**

A few examples, more common at Whitefish than in the deep forest.

***Culiseta impatiens* Walker.**

Two females were taken in forest in the valley of Two Medicine River to the east of the divide. Probably sparingly distributed throughout the forest.

Culiseta incidens Thomson.

Not taken, though as it occurs at Banff, it may possibly be found further down the range.

Before leaving the subject of the Rocky Mountain fauna, it may be well to refer to other collections made in the same general region. The writer, with Messrs. Caudell and Currie, collected in Kaslo, British Columbia, in 1903. At that time I had no knowledge of the adults and had to depend on the determinations of others. All of the black-legged species were at first lumped together as "*punctator*." Later Mr. Coquillett differentiated the species *pullatus*, but this was made again the receptacle of several forms. Most of the old specimens are in bad condition, but on going over them again, I easily separated a series of *cataphylla* and another of *lazarensis*, showing that we have to do with practically the same fauna as at Glacier National Park. The species *trichurus* was described from Kaslo. Later I made collections at Banff and Lake Louise. The fauna of the former is dominated by *intrudens* and *cataphylla*, of the latter by *cataphylla* alone. I have also good collections from Mr. C. Garrett from Cranbrook, B. C., and here, also, *cataphylla* is the dominant form. The predominance of *lazarensis* in the Glacier National Park indicates a more continuously forested condition. Banff has many open spaces. and Lake Louise and Cranbrook are dominated by the open fauna. Of course the occurrence of suitable river-pools has much to do with the abundance of *cataphylla*. Such pools appear to be scarce in the Glacier National Park.

I am indebted to Mr. George E. Goodwin, Chief Civil Engineer of the National Park service; Mr. J. Ross Eakin, Superintendent of the Glacier National Park; Mr. H. A. Noble, of the hotel service; and Mr. George Moore, of the transportation service, for assistance kindly rendered or offered.

TWO NEW BLEPHAROCERIDAE

(Diptera)

By C. B. D. GARRETT

When collecting in the rough country of Wilson Creek, it being the first large creek from the west running into the Elk River above the Elk Prairie bridge, which is 4 miles out of Michel, British Columbia, in August, I noticed Blepharocerids sitting on the under side of logs that had fallen across the creek. They seemed to enjoy places where there was a moist spray, and it did not matter if there was moss on the log or not. They were quite common on the 26th of August, when I took eleven in an hour or so, they being more abundant for the first mile above the north and south forks, up the south one. About 5 p. m. they used to sit on the end of the boughs of spruce trees along the creeks from 8 to 10 feet up. Upon looking up the name the species seemed to be new, and a recent letter from Dr. J. M. Aldrich says that he thinks there have been no new American species described since Dr. Kellogg's paper (Proc. Cal. Acad. Sci., 1903). It is therefore through the kindness of Dr. Aldrich that I offer these as new.

Bibiocephala canadensis, new species.

Length: Male and female about 10 mm.; wing, 10 mm.

Male: General color obscure blackish gray brown, leg-bases yellow shading to brown tarsi. Head, occiput and face grayish white pruinose, eyes narrowly separated (in both sexes), and bisected about midway; facets with thick short golden pilosity. Antennae 15-segmented, all almost equal in length except the basal one, which is longest, and segment 3 about twice as long as the following ones. It also has a pale yellow base, while all the rest are brown. Palpi, pale yellow, segments 2 and 3 about equal in length, as are 4 and 5. Thorax, dorsum opaque black brown, usually with a cephalic thin yellow line, all the mid portion at the base of the scutellum pale yellow, branching V-wise to near the tubercular pits. Dorsum bare, except a single row of short black cephalic hairs, to about midway. Scutellum yellow (or brownish), on the basal lateral edge a thick cluster of black bristly hairs, thinning out to the

apex. Pleura gray, pruinose; mesopleura yellow and halteres, which have a dark tip. Abdomen, bases of one to five smoky gray, shading to blackish: apically with a thin gray edging. All with scattered coarse black stubby hairs. Ventral segments yellow brown. Legs, hind femora and tibiae almost as long as the whole mid leg. Coxae, trochanters and femoral bases yellow, shading to brown, until the tarsi are dark. Hind tibia with spurs. Wing, with a more or less definite subcosta to above the origin of Rs : Rs to the origin of R_2 slightly over twice as long as from R_2 to the rise of R_4+5 ; R_2 from Rs to R , about two and a half times as long as Rs , in most specimens the tip of R_2 turns abruptly into R with the result that there is a stub at the corner continuing along the line of the even direction (in one wing of a female it actually reaches R). A similar condition exists near the origin of Rs but the stub is rarely present. R_2 joins R beyond a third of R and almost above the base of M_3 ; R seems straighter than in *comstocki*, and the tip of the wing more extended, making the margin of cell R_3 longer, and broader; M_3+4 lies midway between M_1+2 and Cu_1 ; M Cu cross-vein joins the deflexion of Cu slightly farther up Cu ; Cu very much broader than the margin of cell R_4+5 ; Cu_2 shortly after leaving Cu_1 curves abruptly down to the margin.

The female differs from the male in the mouth parts, which are relatively longer. Segment 3 of the palpi is longer than segment 2, 4 is slightly over half the length of 5. Antennal segments 1 and 2 are about equal, spherical, and much broader than the base of 3. The female has a slightly longer R_2 , the stub referred to above is more pronounced, actually reaching R in one wing. One specimen is yellow brown all over, thus probably a teneral, though free-flying.

Described from fifteen free-flying specimens, eight male, seven female; Wilson Creek, Michel. B. C., 5,000 feet (C. Garrett). Eleven taken on August 26, 1921; two on 27th, the rest on 7th and 18th of September. Types in the author's collection; paratypes in the Canadian National and U. S. National collections.

Bibiocephala kelloggi, new species.

Male, eyes narrowly separated. General color blackish brown, pruinose, reflecting yellowish, brown or silvery. Branch of R_2 joining R near its tip. Head, occiput, front and epistoma grayish black, with long black pilosity all over; eyes divided about midway, and much long black pilosity; antennae dark brown, base of segment 3 paler. Thoracic dorsum blackish, a thin cephalic yellowish line to the suture, an oblong spot behind the tubercular pits yellowish, much long black villosity scattered all over. Scutellum dark brown; mid basal portion yellow-black, pilose all over. Pleura gray-black, silvery pruinose, the front half with long black thin hairs, hind half bare. Abdomen, blackish, or according to reflection, golden yellow brown. Coxae, trochanters, and femoral base brown, the rest dark; tibial spurs on mid and hind legs, fore femora and tarsi 1 incrassate. Wings of normal pattern, but branch of R_2 ending near the tip of R .

Monotype, male, Cranbrook, British Columbia, July 13, 1921, in the city (C. Garrett).

Just how this specimen got here is a puzzle, contrary to the usual family habits. The region is more or less flat, there are no swift streams, no rocky streams, and the altitude is 2,950 feet. Possibly it may have arrived on the train from the Crow's Nest direction. It is named after Dr. V. L. Kellogg.

A MERISTIC VARIATION

(Diptera)

In examining a number of *Leria serrata* taken in Cranbrook, British Columbia, on June 6, 1921, I was much surprised to find a female with two complete scutella, each with the usual two pairs of bristles. The second scutellum is slightly smaller than is usual and both have struggled for the center of the thorax, the smaller one being a little on one side. There is but one postorbital bristle on one side where two are usual; otherwise the insect seems normal.

C. B. D. GARRETT.

MOSQUITO NOTES

(Diptera, Culicidæ)

BY HARRISON G. DYAR

***Aëdes iridipennis*, new species.**

Head with pale yellow scales, some rather broad; a patch of black ones on each side; bristles black. Mesonotum with dense narrow curved scales, black and pale yellow intermixed, the black predominating in two central bands and posterior side-stripes, the yellow forming a narrow line between these, a patch in front of wing-base and a border to ante-scutellar space. Abdomen black, with narrow basal segmental white bands, triangularly widened on the sides; venter pale, with a black medio-ventral band, broken at apices of segments and some black on the posterior borders of the segments laterally. Legs deep blue-black, the setae pale by contrast; femora whitish below towards base; knee spots narrowly whitish. Wing-membrane clear, strongly iridescent; scales narrowly ligulate, black. Claws of female toothed on front and mid legs.

Type, female, No. 25264, U. S. Nat. Mus.; head of Indian Creek, south base of Cochise Head, Chiricahua Mountains, Arizona, altitude, 6,100 feet, biting by day in a cave, August 17, 1917 (C. H. T. Townsend).

A second female, Bogotá, Colombia, 1918 (Fr. Apollinaire-Marie), the property of the Museum of Natural History, Paris, France, is very similar. The light scales of the head and mesonotum are a little darker and more golden yellow, the dark areas less sharply marked. The wing scales seem a little darker, and tend to be denser at the bases of the fork-cells and third vein. The specimen is damaged, proboscis and antennae missing, as well as all legs save one fore femur and tibia and one hind femur. The abdomen is well preserved. The specimen may not be conspecific with the above, but seems so close as to deserve citation.

***Aëdes terreus homoeopus*, new subspecies.**

Specimens of *terreus* Walk., occurring in the northern part of the range of the species, show a difference in the male hypo-

pygium. The inner area of the side-piece is normally weakly chitinized, and in the usual form shows no differentiation. In the present form there is an angular thickening about the middle, encroaching on the weak inner area. The coloration of the adults is as usual, the male with the mesonotum silvered across, the female with dark central band.

Type No. 25253, U. S. Nat. Mus.; three males, Alajuela, Costa Rica, August and October, 1921 (A. Alfaro); Cordoba, Mexico, March 7, 1908 (F. Knab).

Culex (Choeroporpa) pose Dyar & Knab.

Mr. G. H. Bradley is the fortunate discoverer of the male of this species, which proves to be abundantly distinct. The species was bred at Mound, Louisiana.

Male hypopygium. Side-piece somewhat swollen, curved, convex, a lunate area of fine hairs on the convexity. Clasper constricted in the middle, a little less than the apical half swollen, parallel sided and elliptical, a crest of short fine pile on the anterior declivity; lower termen projecting and upcurved, crossing the elliptical appendiculate spine; a sinuous groove from the spine base; one seta at the upcurve of this groove, and another near the base of the enlargement. Outer division of lobe of side-piece with a slender and rather long stem, a large quadrately expanded leaf in the outer setal group, about as long as the setae, which are all flattened and curved; inner arm short but distinct, with the usual hooked filament and short accompanying one. Inner division of lobe of side-piece with some minute spines at base, furcate, the arms unequal, the inner only about half as long as the outer, each with a long sinuate filament with expanded hooked tip. Tenth sternites with long slender stem and comb-shaped tip, about ten teeth in comb. Second mesonotal plate broad, the tip curved outward at right angles, furcate, both arms pointed and smooth, the lower the longer; a third long sharp point on the stem at the base of the outward curve, being subapical. Ninth tergites large, elliptical, with many setae, approximate and outwardly oblique.

In the table of species (Ins. Ins. Mens., viii, 79-81, 1920), this runs—2, 5, 12, 15, 16, 19, 20, 21, 22, falling with *mutator* and *leprincei*. There is no appreciable difference in the genitalic type from that of these two species; but the very distinct coloration of the adult will make confusion unlikely.

Culex (Isostomyia) bifoliata, new species.

Male palpi very short; proboscis long and stout; pleurae and anterior edge of mesonotum pale greenish, the dorsum obscured by a vestiture of fine dark brown hairs, thin in spots and with two narrow bare lines of whitish color; bristles sparse and long, black. Abdomen entirely black. Legs bronzy black, the femora pale beneath. Wing-scales narrowly ligulate. Vertex very broadly with narrow curved white scales, the erect forked ones also white; narrow ovate white scales low on the sides. The white scales are intermixed sparsely with black ones, especially posteriorly.

Male hypopygium. Side-piece elliptical with tapered tip, convex, a little swollen; an area of dense stout setae on the inner side, the upper hairs directed outwardly and curved. Clasper long and rather slender, roundedly bent at right-angles in the middle; a membranous ridge beneath outwardly; spine thick and much widened, appendiculate; a crest of short stout minute spines on outer aspect. Outer division of lobe of side-piece a single rod with four filaments at tip, one with hooked tip, one smaller, the other two subequal and stout; two crooked curved leaves of moderate size, strongly inserted on the stem, at basal and apical thirds respectively. Inner division of lobe of side-piece a long rod, exceeding the outer division, bearing two rather short stout filaments at tip, the inner more basally inserted than the outer. Tenth sternites rather broad and membranous, one margin thickened, the tip curved-comb-shaped with about six teeth. Second plate of mesosome smooth, narrowly elliptical, concave; basal hooks curved, with broadly spatulate tips. Transparent triangular plates with finger-shaped ends present at the angles of side-pieces. Basal plates large, emarginate. Ninth tergites undeveloped, a few setae in a

group on the narrow band of chitin representing the segment.

Types, four males, No. 25254, U. S. Nat. Mus., no females definitely associated: Mandingo, Canal Zone, Panama, December 22, 1921, bred from larvae found in a hole in a plum tree (J. B. Shropshire); Miraflores, Canal Zone, Panama, December 15, 1921, bred from larvae found in a tree-hole (J. B. Shropshire). The first culture contained three males and a female, but the latter appears to belong to some other species of *Culex*, probably *Culex mollis* D. & K.; the second culture produced one male of this species and three specimens of *Haemagogus argyromeris* D. & L. A female bred from a larva found in a tree-hole, December 31, 1921, without exact locality, apparently belongs here, but as no male is associated, it has not been made a type. Some females, bred from larvae found in containers at Miraflores and Balboa have been placed here, but it is not certain that they belong to the species. They more probably appertain to *Culex nigripalpus* Theo.

Near *corriganii* D. & K. (*chalcocorystes* Mart.), readily differentiated by the details of the hypopygium. The structure of the clasper is as in *conservator* D. & K. (*divisor* D. & K.), which also has no leaves on the outer division of the lobe of side-piece.

These species with reduced male palpi present an interesting series. In *restrictor* D. & K. (*consternator* D. & K.), which I placed in *Micraëdes* (Ins. Ins. Mens., vi, 102, 1918), the male palpi exceed the proboscis. Both divisions of the lobe of side-piece are rod-like and short, the inner with the two filaments nearly normal, but shortened, the outer with five filaments, one of which is very strong and tusk-like. This is a continental form, from Mexico and Panama.

In (*Tinolestes*) *latisquama* Coq., a crab-hole species from the continent—Costa Rica and Panama—the male palpi are about half the length of the proboscis. The clasper is smooth and very stout. The inner division of the lobe of side-piece is short, columnar and stout, with the two filaments short and thick, tooth-like with expanded tips; the outer division is approximated to the inner, sessile, with one long, tapered very

stout spine and two or three stout setae, confused with the vestiture.

In (*Micraëdes*) *bisulcatus* Coq. from the Antilles—Martinique, Porto Rico, Cuba (the Santo Domingo type has disappeared from the collection)—the male palpi are a little shorter, being only a little over one-third the length of the proboscis. The clasper is simple, slender and long. The inner division of the lobe of the side-piece has the two filaments shortened and thick, the outer on a rather long pedicel, the inner sessile at the base of this. Outer division very short, bearing the five setae at different angles from large tubercles, one of them stout and long. This genitalic structure is essentially as in *restrictor*, or even less developed in the direction of *latisquama*, though the adult male palpi have degenerated.

In the remaining three species, the male palpi are very short, as short as those of the female. (*Micraëdes*) *corriganii* has the clasper smooth, curved and rather short. The inner division of lobe of side-piece columnar, short and thick, the two rods inserted nearly together from the summit. Outer division short, the six setae radiating from the crown, about alike. The species occurs in Panama.

The last two species have the clasper angularly curved and beset with small spines on the outer terminal aspect, though not thickened. (*Isostomyia*) *conservator* D. & K., from Trinidad and Surinam, has the outer division of the lobe of side-piece short and stout with six radiating spines, two long and stout, one shorter, and two small and slender. In (*Isostomyia*) *bifoliata* Dyar, from Panama, this part is lengthened and bears two leaves, as described above.

Culex (Choeroporpa) iolambdis Dyar.

Mr. J. B. Shropshire fortunately discovered a second male of this species, bred from larvae in surface-water at Gold Hill, Canal Zone, Panama, December 31, 1921. The characters rested heretofore only on the single male type, which is entirely confirmed by this second specimen.

Culex (Choeroporpa) aneles Dyar & Ludlow.

Mr. Shropshire is also the discoverer of a second male of this species, bred from larvae in a swamp, Gatun, Canal Zone, Panama, October 29, 1921. The type was taken at Cardenas, February 11 of the same year.

Wyeomyia modalma, new species.

Prothoracic lobes moderately well separated; clypeus and postnotum nude. Occiput black-scaled with blue reflection. Prothoracic lobes coppery golden. Mesonotum with thick flat scales with brown and blue luster, evenly concolorous with scutellum. Abdomen bluish black dorsally, silvery white below, the colors separated in a nearly straight line, very slightly indented in the centers of the segments. Legs black with brassy luster beneath; mid tarsi with outer half of second, third to fifth joints white; hind tarsi with fourth and fifth joints white below, a small black dot on the fourth joint at tip. Wing scales ovate, rather narrow.

Types, five females, No. 25256, U. S. Nat. Mus.; one, "hand catch from Gatun," Canal Zone, Panama, December 10, 1921 (J. B. Shropshire), three, "hand catch from a house at Paja," Canal Zone, Panama, January 16, 1922 (J. B. Shropshire).

Allied to *agnostips* D. & K., but that has a large white spot on the vertex. The white on the mid tarsi of *agnostips* is similar; the single type has but one hind leg remaining, and that has lost the last three joints, which may have been white-marked also. However, the marking of the head seems sufficient difference. The two species are of the same size, and both have a rather short stout proboscis. The wing-scales also are similar. The male and larva are unknown in both species.

Wyeomyia (Shropshirea) ypsipola, new species.

The peculiar male hypopygium requires a new subgeneric term, for which *Shropshirea* is proposed in honor of the discoverer. The side-pieces (Plate II, fig. 7) are reduced, practically hairless and enclosed within the tip of the abdomen when at rest. The three setae in a row remain; at the extreme tip are a few minute hairs; a lobe just before the tip gives rise

to a copious curving hair-tuft. Clasper very broadly and irregularly articulated, apparently of three lobes. Main lobe irregularly tapering, with a shoulder at one side and an angular fold further out on the other side; some minute hairs on shoulder and tip. Second lobe thin, with two terminal angles, one side forming a recurved hook. The third lobe is slender and forked, but I cannot make out its attachment in the single slide.

The vestiture of the single specimen is not well preserved. Apparently the prothoracic lobes are dark with white tip; occiput dark, white scaled below, perhaps with a white margin to the eyes or vertical spot. There seem to be some white scales in this position. Mesonotum and scutellum dark scaled. Clypeus and postnotum without scales, the lateral seta of the postnotal tuft appears to have a triangularly widened tip. Abdomen with the colors separated on the sides in a straight line, the venter peculiarly marked, the segments having a dark posterior border, which widens on the sides, broader posteriorly, the last two segments having only a white V at segmental base. Legs black, the mid tarsi white below continuously on joints 2 to 5. The wing scales are rather broadly ovate. Proboscis long, but quite stout.

Type, male, No. 25257, U. S. Nat. Mus.; "bred from larvae found at Comacho in a tree-hole," January 14, 1922. The species bred from this culture were as follows:

<i>Aedes thorntoni</i> D. & K.....	2
<i>Aedes terreus</i> Walk.....	3
<i>Limatus asullepta</i> Theo.....	1
<i>Haemagogus argyromeris</i> D. & L.....	2
<i>Wyeomyia ypsipola</i> Dyar.....	1
<i>Culex corniger</i> Theob.....	5
<i>Uranotaenia geometrica</i> Theob.....	9

Most of these are well-known tree-hole breeders; *Culex corniger* occasionally occurs in tree-holes. However, the *Uranotaenia geometrica* is an open ground-pool breeder and never occurs in tree-holes. There is, therefore, something the matter with the record, and an admixture of ground-pool forms

has occurred. It is therefore possible that the *Wyeomyia ypsipola* did not come from a tree-hole, although it probably did so.

I have been unable to find any described female to which this male would fit. The imperfection of the vestiture renders the task more difficult than usual, and it is hoped better material may be found. The structure is so remarkable, however, that it seems desirable to record it. The most likely comparison seemed to be with *Wyeomyia celaenocephala* D. & K., described from Guatemala. However, the single female type of this species seems to have distinctly violet prothoracic lobes, and it is a smaller and slenderer insect. No other species with the mid tarsi only white-marked comes as near. *W. abia* D. & K. from Dominica comes next, but this, too, is a small slender insect with delicate proboscis, the prothoracic lobes with a distinct violet tint.

Goeldia paranensis Brèthes.

Lynchiaria paranensis Brèthes, Bol. Inst. Ent. y Pat. Veg., i, 40, 1912.

This species was not placed by Dr. and Mrs. Bonne in their recent table of the species of *Goeldia* (Ins. Ins. Mens., x, 38, 1922) on account of lack of material. A female specimen is now before me, by the kindness of Dr. Juana Petrocchi. The species is small for a *Goeldia*, though not as small as *espini* Mart. The prothoracic lobes are remote, and the generic location seems correct. Clypeus and postnotum nude, the tuft of setae on the latter distinct. The tarsi are entirely dark; proboscis as long as abdomen; abdominal colors strongly roundedly incised; scutellum concolorous; lateral and ventral abdominal scales yellowish white.

It thus falls in the table between *lunata* and *espini*, intermediate in size and coloration between these species, nearer *espini*. *Lunata* is a distinctly large species, with dark marks on the pleura under the silver scaling, which is absent in *espini*, slightly indicated in the sutures in *paranensis*.

NEW CHALCID FLIES FROM EASTERN
AUSTRALIA—II*(Hymenoptera, Chalcididae)*

By A. A. GIRAULT

Paracladella dei, new species.

Blue; legs 1 and 2 (save coxa 2 and middle tibial spur), scape, pedicel, red-brown. Fore wing embrowned from base of stigmal to apex, two triangular clear spots opposite, one at apex stigmal, apices toward middle. Funicle 1 longer than wide, exceeding pedicel, rest subquadrate. Mandibles this genus acutely bidentate.

Forest, Wynnum, Queensland.

Babinda, new genus (Eulophini).

Depressed, especially thorax. As in *Grotiusella*, but club 2-jointed, scape dilated, mandibles wide, 9-dentate, one hind tibial spur twice the other; scutellum wider than long, oval, simple, propodeum as long as it. Coxa 3 long, compressed. Marginal thrice stigmal, latter somewhat shorter than post-marginal. Axillae minute.

Babinda murarriensis, new species.

Aeneus, wings clear, legs lemon save coxa and femur 3; clypeus, antennae yellow; ring-joint very short, club 1 over half club, pedicel exceeding funicles 1 or 4, other funicles wider than long, 1 quadrate. Propodeum glabrous.

Murarrie, in bushes margin of mangrove, May 3, 1921.

Cristatithorax nobilis, new species.

Blue, legs white save distal third femora 1 and 2, distal half femur 3, basal fourth tibiae 1 and 2, basal sixth tibia 3 which are concolorous. Scape, pedicel brownish, funicles 4-6 white, all funicles very short, 6 largest, scape not much dilated. Like others.

Jungle, Mulgrave River, November.

Entedonomorpha robusta, new species.

Like *unica*, but legs white, so scape; pedicel and funicles 1-2

reddish brown; mandibles 4-dentate; grooves of scutellum distinctly separated at apex, of continuous punctures.

Jungle, Nelson, November.

Eupelmus froudei, new species.

Runs to *montagnei*, but distal third ovipositor black, scape reddish, coxa 2 yellow, femur 1 (also 3) metallic laterad, tibia 1 so at base; postmarginal equal the shorter stigmal. Funicle 2 longest, a bit longer than wide.

Cairns, jungle, May 23, 1918.

Proaphelinoides australis, new species.

Pale yellow, vertex orange; abdomen dusky save basal third, save lateral margins narrowly; lateral margin propodeum dusky; ovipositor one-fourth abdomen, white. Upper hind femur dusky. Fore wing with disk infuscated from a little before apex of marginal and with a tolerably narrow fuscous stripe across at the clump of black setae toward base of marginal; apical margin more widely clear. Funicles equal, wider than long; club 1 equal pedicel, a third longer than wide, exceeding funicle; club 2 over twice 1, exceeding pedicel and next three joints united. Stigmal sessile, not parallel, dusky. Marginal cilia short. Scutellum with four setae; scutum, pronotum with long black hairs, scattered.

Two females, Nelson, forest, July.

Casca machiaveli, new species.

Brownish black; legs, antennae, lateral and distal margins scutum, parapsides, propodeum, pale gold; scutellum white, with a median groove. Fore wing with deep fuscous cross-stripe from marginal and stigmal, fringes nearly half width, 12 lines discal cilia. Middle tarsals subequal, spur exceeding joint 1. Club twice the funicle, wider, its joints over twice longer than wide; funicle 1 equal pedicel, 2 shorter by a fourth. Tibiae 2 and 3 dusky at base. Head often yellowish, parapsides cephalad black; back of scutum conically extending nearly to apex. Funicle 2 quadrate, club 3 shorter than 1.

Nelson, April and May, on windows, Mulgrave Sugar Mill.

Closterocerus abelardi, new species.

Blue, wings clear; tip tibia 3, distal two-thirds of 2, distal third of 1 and tarsi white. Femur 3 rather flat. Scape flat, gradually dilated from base; clubs smaller than funicles. Face with a V-shaped carina with apex at mouth, each arm going dorsad along (near) eye-margin; other characters of genus present. Wings ample. Propodeum noncarinate, thorax finely scaly, parapsidal furrows faint.

Watsonville, Queensland, forest, March.

Note: Owing to bad manuscript, tibia 1 may be white for distal two-thirds, the type at present not available.

Metapelma bachi, new species.

Like *westwoodi* but femur 3 all blue, femur 1 at basal half or less and ventrad to knee, tibia 1 dorsad blue. Propodeal spiracle round, far caudad near the angle of the carinated caudal margin.

Forest, Nelson, January 11, 1919 (type), and Brisbane, three females, February, March (Hacker).

Neochrysocharella chamaeleon, new species.

Like *fasciatiipennis* but central third femur 3, a narrow cinctus near base of all tibiae (faint in 1) and ventral edges widely at center of femur 2, black. Also blotch of fore wing rather faint, scape somewhat compressed and white basal two-thirds.

Nelson, forest, April.

Neochrysocharella froudei, new species.

Like preceding species but scape slenderer, white, black of femur 3 irregularly broken centrally, the cinctus of tibia 3 is longer, extending a bit beyond middle; blotch of fore wing distinct; setae from marginal twice longer, subequal to post-marginal in length. Types compared (first coxae not seen in *froudei*).

Wynnum, forest, April.

Diaulomyia floris, new species.

Like genotype but femur 3 concolorous to tip, fore wing with

two smaller blotches, a round one under base of marginal and a large, oblique, subrectangular one from apex of stigmal, its axis caudo-proximad; tibia 3 concolorous near base. Antennae near clypeus.

Wynnum, forest, April 25, 26, 1921.

Paracaenocercus albifemur, new species.

Like genotype but frons wider, postmarginal equal marginal, stigmal over twice marginal, legs snowy except coxae 2 and 3, dot on knee 2 and basal two-thirds or more of tibia 3. Funicles quadrate, shorter than pedicel, larger distad. Club wide. Resembles *Schedius uncinctipes*.

Wynnum, forest, April.

Anagyrodes baethei, new species.

Like genotype but blue, antennae and legs brown, club darker. Costal cell five lines discal cilia. Scrobes deep, short, complete. Club wider, short, mandibles with two unequal acute teeth.

Maringa, jungle.

Brachychrysocharopsis, new genus.

Like *Brachychrysocharella* but antennae with one distinct ring-joint, 2 funicles (1 longer than wide, 2 like the ring-joint) and three clubs of which 1 is transverse-hemispherical, 3 ending in a prominent spicule.

Brachysocharopsis aligherini, new species.

Brownish black, wings clear; lateral margin scutum and faint spots down each side of meson of abdomen, pale yellow, vertex and face ivory. Legs, antennae pallid dusky save coxae, pedicel and club. Scape compressed. pedicel short, thick, longer than wide, exceeding funicle; club 2 large, quadrate, 3 longest, equal funicle and pedicel united. Stigmal twice post-marginal, not long. Discal cilia dot-like, dense, fringes one-third width. Color description approximate as to body markings; details of scutellum missed.

Watsonville, forest, March 12, 1919.

Gonatocerus ipswichia, new species.

Like *ayrensis* but funicles unequal, 1 as long as 6, twice longer than wide, 2, 3 and 7 longest; abdomen with two not quite complete cross-stripes, one a bit beyond middle, two between it and apex, but nearer one, apex clear. Apex prothorax and parapsides black; dot mesal corner axilla and a spot mesal base scutellum dusky. Discal cilia to base marginal. Legs and head yellow.

Ipswich, forest.

Polynema dei, new species.

Brownish black save antennae (save distal five joints), petiole, basal half abdomen and legs save distal third femur 3, these honey. Wings as in *sappho* but instead of disto-cephalic spot, both wings with apical margins narrowly infuscated. Fringes equal width, discal cilia proceeding in one line half way to venation from cross-stripe. Funicle 2 longest. Fore wings distinctly paddle-shaped; narrowed markedly from venation, then widening at cross-stripe.

One male, captured with *Gonatocerus ipswichia*.

Leptomastix dei, new species.

Purple, coxa 1, propleurum, prepectus orange, or more or less so, also dorsal thorax laterad of scutellum, base of tegula, head (more so at clypeus) and neck of prothorax. Wing black from some distance before bend of submarginal (also along submarginal from base) nearly to apex, black, convex distad, with an elliptical hyaline area obliques proximad nearly to caudal margin from bend of submarginal and a narrow, convexed (toward base) hyaline cross-stripe from apices of postmarginal and stigmal, latter a third shorter than the former which a bit exceeds marginal. Funicle 6 over twice longer than wide, 1 five times its width, twice the pedicel. Joint 1 of tarsus 2 and the spur white.

Two females, forest, Wynnum, May 1, 1921.

Eucheiloneuropsis, new genus.

Like *Cheiloneurella* but jaws with two acute, equal teeth,

stigmal longer equal to the four times longer than wide marginal, postmarginal shorter than either, face not inflexed, scrobes short. Compare *Leptomastix* which has a wider frons and funicle 1 elongate. Genotype following:

***Eucheiloneuropsis lotae*, new species.**

Purple; head except occiput interiorly, the slender scape save dorsal edge, prothorax, leg 1 save coxa and base of femur, scutellum, axillae and the area surrounding the tergula, orange. Femur 2, tarsi 2 and the spur, white. Fore wing smoky from bend of submarginal to apex deeper across from marginal, accented along stigmal and against bend of submarginal; a convex, wide clear cross-stripe at end of venation. Setae from venation not great. Funicles 2-4, twice longer than wide, shorter than pedicel. Discal cilia dense, faint except in infuscation.

Wynnum, forest, March.

***Eucheiloneuropsis lowelli*, new species.**

Like *lotae* but legs 1 save femur toward apex inwardly, femur 2 at base, prothorax on neck, axillae purple, no white at extreme base tibia 3 and antennae, cheeks below eyes (narrowly joined across the antennae), occiput except margins (dorsal more widely) and median line scutellum nearly to apex, purple. Postmarginal barely developed.

Wynnum, forest, April 27, 1921.

***Orasema palgravei*, new species.**

Blue, wings clear; knees, tibiae, tarsi white; scape pale red, pedicel, base funicle 1, venation pale brown. Head polished; clypeus convex at apex, there with four long, colorless spinules; pronotum glabrous, cephalic scutum with cross-striae, elsewhere rugose-punctate like scutellum. Parapsides with cross-striae, axillae joined, with six to seven oblique striae. Scutellum at apex with an entire, foveate rim, before this glabrous rather widely. Propodeum smooth, with a median paired row of foveae and a lateral foveate groove. Petiole over twice hind coxae, finely striate. Postmarginal twice sessile stigmal. Funicle 1 thrice the short pedicel, longest, 2 and 3 equal, thrice longer than wide.

7 ovate, club solid, equal funicle 1, 11 joints. Ring-joint distinct. Scutellum from laterad as in *Epimetagea*. Male the same but funicle longer, 8-jointed, club shorter, hind tibiae save tips, funicle 1 concolorous, petiole longer.

Greenhills, Cairns, May 31, jungle, many specimens.

Taneostigmodes silviae, new species.

Like *globosus* but somewhat smaller, abdomen immaculate, propleurum yellow, coxae only darkened, pedicel all white, the funicles longer, 1-5 nearly twice longer than wide, 6 quadrate, equal pedicel. Characterized by having the moderate, convex dilation of scape, abruptly, widely scooped out at ventral aspect, so scape is cylindrical shortly at apex. Segmentation of club subobsolete. Types compared.

Pentland, Queensland, forest, November, 1917.

Baoanusia lotae, new species.

Like *perfuscipennis* but funicles 5-6 white, club only a third longer than funicle, joints of latter twice wider than long; infuscation of fore wing from base of marginal. Circular scrobes orange; frons very narrow. Leg-color uncertain, as type was accidentally lost during its description.

Lota, Queensland, forest with young *Casuarina*, March 20, 1921.

Eucheiloneuropsis regalis, new species.

Differs from *lowelli* principally in that the postmarginal is distinct, at best twice longer than wide and about half the stigmal, quadrate in the other; stigmal subequal marginal (shorter in the other). Of the three species, *lowelli* is the only one with a continuous line of discal cilia from base to main ciliation, along the submarginal; in *lowelli*, ocelli in an equilateral triangle, in *regalis* and *lotae* not quite so. Also *regalis* lacks the metallic on the cheeks.

Brisbane, sweeping *Leptospermum*, April 16, 1913 (Hacker).

Tomicobomorphella heinei, new species.

Like genotype but antennae a bit higher, stigmal, postmarginal, marginal equal, pronotum a bit larger, propodeum

with median carina only, abdomen 2 longest. All metallic save club, legs 1 beneath and tibia, knee 2, tibiae 3 at base and tarsi 1-2. Fore wing trifasciate, 1 narrow, with long bristles at base, 2 from whole of marginal, 3 narrowest, the apical margin. Resembles somewhat *Erotolepsiella*.

Forest, Watsonville, March.

Chalcis ogyrisidis, new species.

Black, wings clear, coxa 3 save at base above (sometimes basal half), femur 3 and last joint of tarsi 2 and 3, dark red. Umbilicately punctate, plate of scutellum incised at meson; scrobicular cavity cross-striate. Lateral ocellus its diameter from the eye. Funicles 1-3 a half longer than wide, rest shortening. Propodeum rugulose. Segments of abdomen with cross-row of microscopic punctures at apex preceded by one or two rows of pin-punctures but 2 with the latter only, an area near apex dorso-laterad, 3 with the rows running dorso-mesad, absent at meson, 7 punctate. Femur 3 with seven teeth, 1 widest, 3 and 4 of others, longest. Tegulae except at base, margined with whitish.

A pair and another female, from pupae of *Ogyris amaryllis*, Brisbane, 1919 (H. Hacker).

Pirenoidea, new genus.

Like *Cryptomphale* but postmarginal absent, mandibles apparently absent, parapsidal furrows apparently complete, no ring-joint, fringes half wing-length. Scape distinctly widened, flagellum short-clavate, pedicel elongate, over twice longer than wide, exceeding funicle; joints of latter, 1 twice, 2 nearly thrice wider than long, large; club unarmed, ovate, widest. Stigmal long, marginal exceeding submarginal. Setae from marginal elongate. Scape equal flagellum.

Pirenoidea dei, new species.

Black; wing with a light dusky cross-stripe from whole of marginal; tarsi and tibia 1 more or less pale. No long hairs from flagellum. Resembles *Pirene*, and was mistaken for it.

Scantiness and nature of type material precludes fuller description.

From window in a produce warehouse, Brisbane, May 9, 1921.

***Coceophagus lucani*, new species.**

Differs notably from *tennysoni*. Antennae acuminate, funicles 1-2 unequal, 1 a bit longer than wide, 2 a third longer than wide, 3 still longer, subequal club 1 and seeming more or less part of club. Clubs 2-3 longest, twice longer than wide; abdomen with a large spot at each side of apex; tibiae 2 and 3 with a cinctus just below knee; femur 3 black dorsad between base and middle; ovipositor extruded shortly. Middle tibial spur exceeding tarsal 1.

Grass in boggy forest, Cannon Hill, April 18, 1921.

***Cerchysiopsis*, new genus.**

Like *Cerchysius* but small, marginal subquadrate, thickened, equal stigmal, latter a bit shorter than postmarginal. Ovipositor valves slender.

***Cerchysiopsis lowelli*, new species.**

Aeneus, wings clear, knees, tibial tips, tarsi white. Jaw-teeth equal, frons moderate, scrobes forming a triangle. Ovipositor three-fourths abdomen, hypopygium to abdomen's tip. Pedicel much exceeding funicle 1, 5-6 of funicle largest, 6 a bit longer than wide, others small, wider than long; 6-8 lines discal cilia proximad of hairless line. Club much wider than and three-fourths length of funicle.

One female, forest, Wynnum.

NEW EUPELMINAE FROM AUSTRALIA

(*Hymenoptera*)

By A. A. GIRAULT

The following species were discovered while revising the group. All from Queensland, unless otherwise stated.

***Eupelmus io*, new species.**

Like *pachyscapa* Gir., but deep purple save tibial tips and

tarsi, ovipositor one-fourth longer than abdomen, stripe of fore wing very deep, longer, scrobes excavated.

Irvinebank, in grass about the town, March 15, 1919.

Eupelmus antiphonis, new species.

Like *renani* Gir., but stouter, ovipositor barely extruded, funicles 2 and 3 equal, longest, wings lightly dusky base to apex and with a half (or more) complete cross-stripe of brown across from basal half of postmarginal. From *worcesteri* Gir. in having postmarginal much exceeding stigmal. From *homeri* in having scape much compressed, different infuscation of fore wing and greater stature.

Ipswich, forest, October 26, 1919.

Eupelmus aeschyli, new species.

Stature of *benthami* Gir., but wings clear, scape pale distal half, so tibiae, femur 2 save upper edge, tibia 2 save a spot just below knee.

Ravenshoe, jungle, March 13, 1919.

Eupelmus giottini, new species.

Like *aristotelia* Gir., but lateral ocellus barely separated from eye, scape widely reddish at base.

Eupelmus poggioni, new species.

Differs from *pentatomidivora* Gir. in having lateral ocellus separated from the eye by their own diameters and bearing an oblong reddish spot on femur 3 near apex, dorso-lateral (obscure in others).

Reared from "bug" egg, Brisbane (Hacker).

Eupelmus virgilioi, new species.

Like *varicolor* Gir., but a dot on hind tibia, ovipositor nearly half shorter, the color divisions more equal, abdomen more faintly margined and only for basal half.

Lota, grass, March 20, 1921. Type lost.

Eupelmus homeri, new species.

Like *renani* Gir., but a deep infuscation on fore wing half

way across from marginal and postmarginal. Pedicel elongate.
Pentland, November 21, 1917.

Eupelmus cromwelli, new species.

Runs to *hookeri* Gir. and allies, but ovipositor but shortly extruded, basal half blue, wings clear, legs yellow save coxae and femur 3 save at each end.

Mareeba, forest, March 11, 1919.

Eupelmus heinei, new species.

Like *lavoisieri* Gir., but femur 2 green, equally widely pale at each end, tibiae with a narrow cinctus near base, femur 1 more compressed.

Nelson.

Eupelmus shakespearei, new species.

Like *nelsonensis* Gir., but save coxae legs yellow, ovipositor fourth abdomen. Funicles 2-4 equal, longest.

Wynnum, forest.

Eupelmus lutheri, new species.

Like *darwinii* Gir., but apex of scape yellow, legs yellow save green parts as in named species (but femora 2 yellow, so sides tibiae 1, tibiae 3 with more than basal half green). Rather robust.

Nelson, forest, April.

Neanastatus divinus, new species.

Like *inconspicuus* Gir., but the white at base of tibiae 3 is much longer (basal fourth), as in *flavipronotum*, coxae and femora 1 and 2 concolorous, middle tibial spur black (instead of white); mouth, clypeus yellow, also antennae.

Irvinebank, forest, March 15, 1919.

CORRECTIONS

In this journal, VIII, 1920, p. 143, *Entedonastichus* belongs to the Entedoninae; p. 144, *Eurytomomma* to Eurytomidae; *Neostomatocerus* to the Chalcididae.

THE BLEPHAROCERID GENUS BIBIOCEPHALA.
OSTEN SACKEN IN JAPAN*(Diptera)*

By CHARLES P. ALEXANDER

The genus of net-winged midges *Bibiocephala* Osten Sacken has hitherto been represented only by four described and an additional unnamed species, all from western North America where they constitute the most important elements of the Blepharocerid fauna. It was with more than usual interest, therefore, that I found an undescribed species of the genus among some crane-fly material from Japan, kindly sent to me for naming by the collector, Dr. K. Takeuchi, to whom I am greatly indebted for many favors in the past. The unique type of the new species is preserved in the writer's collection.

***Bibiocephala japonica*, new species.**

Male.—Length, 5.5 mm.; wing, 7.2 mm.

Mouthparts brown. Antennae dark brown, the flagellar segments beyond the base of the first conspicuously incrassated. Head broad, light gray pruinose.

Mesonotum dull gray, the praescutum with three ill-defined brown stripes, the median stripe split anteriorly by a capillary pale line, behind suffusing the median area of the scutum; scutal lobes brownish; scutellum light gray. Pleura and sternum clear blue-gray, the latter more yellowish medially. Halteres yellow, the knobs faintly darkened. Legs with the coxae and trochanters yellow; femora yellow, the tips conspicuously dark brown, on the fore legs including about the distal half, on the elongate posterior femora including only the relatively narrow apices; tibiae dark brown, the bases a little paler; tarsi black. Wings hyaline; veins dark brown; a conspicuous thickening at the anal angle of the wing. Venation: R_2 sinuous, shorter than Rs ; R_3+4+5 in alignment with Rs and a little shorter than it; veins R_3 and R_4+5 divergent apically.

Abdominal tergites dark brown, the sternites pale yellow, the basal sternite dark gray, the eighth and ninth sternites dark brown.

Habitat.—Japan (Honshiu).

Holotype, ♂, Mount Minomo, May 4, 1921 (K. Takeuchi).

CHANGE OF AUTHORSHIP OF CERTAIN NOCTUIDS

(*Lepidoptera, Noctuidæ*)

By A. N. CAUDELL

The following Noctuidæ, described and figured by J. B. Smith in 1894 (Trans. Am. Ent. Soc., xxi) were figured in 1893 under the same names by Danby and Green in Bull. Nat. Hist. Soc. Brit. Col., 17-18, Plate I, where they are entered without description in a check-list and credited to Smith. But the mere crediting of a new species to another does not convey authorship, and as figures validate as well as descriptions, these species are really creditable to Danby and Green, and the types are the originals from which the figures were made (Entom. Code, Pars. 28, 38, and 76).

Pleroma apposita Danby & Green.

Xylomiges candida Danby & Green.

Xylomiges cognata Danby & Green.

Xylomiges pulchella Danby & Green.

Taeniocampa ferrigera Danby & Green.

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THE SPECIES OF PSOROPHORA OF THE CILIATA GROUP

(Diptera, Culicidae)

BY HARRISON G. DYAR

Psorophora ciliata Fab. is a well-known species in North America. Its large size and remarkable shaggy legs at once arrest attention. The species is wholly predaceous in the larval state, subsisting upon the larvae of other mosquitoes, such as occur in transient rain-pools in warmer, open country, which while not arid, is dry enough so that the puddles are more commonly dried up than water-filled. The species occurs throughout eastern North America east of the plains, the northernmost record being Plattsburgh, New York, the southernmost, Tampico, Mexico, although Theobald records it from British Honduras. For a long time it was not considered that more than one species existed in this group, although it was known that a similar form occurred in the Argentine Republic. This has been called also *ciliata*, irrespective of the wide tropical gap between the two.

Recent investigation has convinced me that the group is better represented in the Argentine country than with us. We have only *ciliata* and the doubtful species *ctites*, which though differing at first sight strikingly by the absence of the ciliations, appears to differ in no other character. However, thanks to Mons. E. Séguéy of the Paris Museum of Natural History, who has sent me material for naming, and to Dr. Juana Petrocchi of Buenos Aires, who has also sent specimens, it becomes evident that there are four distinct species in the

Argentine region. The development is in the direction of occupying drier and drier country, until a form is reached (*stigmatophora*) with the characteristic piebald desert vestiture. With us, no such development has taken place. The arid plains of Montana, though teeming with mosquitoes after specially heavy rains, every four years or so, possess no predaceous species of mosquito.

Psorophora ciliata Fabricius.

Culex ciliata Fabricius, Ent. Syst., iv, 401, 1794.

Culex molestus Wiedemann, Dipt. Exot., 7, 1821.

Culex rubidus Robineau-Desvoidy, Mem. Soc. Hist. Nat. Paris, iii, 404, 1827.

Psorophora boscii Robineau-Desvoidy, Mem. Soc. Hist. Nat. Paris, iii, 413, 1827.

Culex conterrens Walker, Ins. Saund., Dipt., 427, 1856.

A diagram of the mesonotum is given in Plate IV, figure 1. There are broad bare spaces corresponding to the usual paired lines and posterior half-lines seen in *Aedes*, subgenus *Ochle-rotatus*. There is a narrow central line of golden scales, separating the two long bare spaces. Near the middle on each side is a narrow black spot, which is continued by a line of black scales to the posterior border. All the sides and antescutellar space are covered with light gray scales.

Psorophora ctites Dyar.

Psorophora ctites Dyar, Ins. Ins. Mens., vi, 126, 1918.

The mesonotal pattern seems to be identical with that of *ciliata*. I therefore entertain some doubt as to the distinctness of the species. No male has been examined as yet, although the form turned up recently in a new locality, mixed with normal *ciliata*. The new record is Augusta, Georgia, July 23, 1921 (S. F. Hildebrand).

Psorophora tibialis Robineau-Desvoidy.

Culex tibialis Robineau-Desvoidy, Mem. Soc. Hist. Nat. Paris, iii, 404, 1827.

Culex perterrens Walker, Ins. Saund., Dipt., 431, 1856.

Psorophora lynchi Brèthes, An. Mus. Nac. Hist. Nat. B. A., xxviii, 204, 1916.

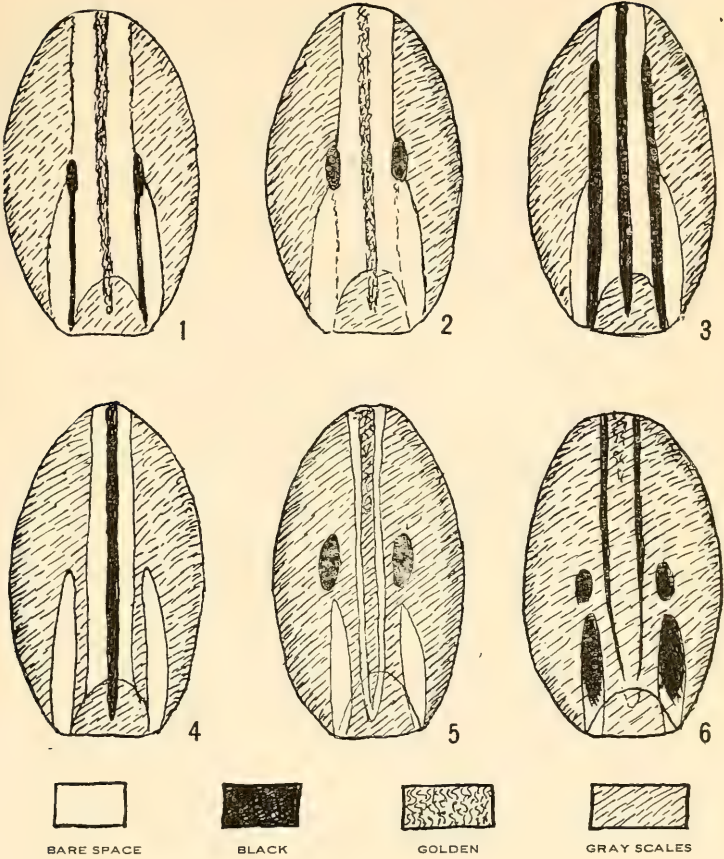


PLATE IV

Fig. 1. Diagram of mesonotum of *Psorophora ciliata* Fabricius.

Fig. 2. Diagram of mesonotum of *Psorophora tibialis* Robineau-Desvoidy.

Fig. 3. Diagram of mesonotum of *Psorophora holmbergii* Lynch Arribálzaga.

Fig. 4. Diagram of mesonotum of *Psorophora agoggylia* Dyar.

Fig. 5. Diagram of mesonotum of *Psorophora stigmatophora* Dyar.

Fig. 6. Diagram of mesonotum of *Psorophora stigmatophora* Dyar, drawn with the bare spaces black to resemble Arribálzaga's figure (Rev. Mus. de La Plata, ii, pl. iv, fig. 3).

A diagram of the mesonotum is shown in Plate IV, figure 2. The general similarity to *ciliata* is at once evident; but the black spots are larger, there are no continuing posteriorly black lines, but only a narrow track of golden scales. The genitalia, which are carefully figured by Brèthes, do not appear to differ perceptibly from the North American form. However, the different mesonotal pattern, coupled with the marked geographic discontinuity, clearly indicates a specific status. The species occurs in southern Brazil and the Argentine region.

Psorophora holmbergii Lynch Arribálzaga.

Psorophora holmbergii Lynch Arribálzaga, Rev. Mus de La Plata, ii, 140, 1891.

The diagram of the mesonotum shown in Plate IV, figure 3, is made up from the very lucid description of Brèthes, as no specimen of this species is before me. The golden scales of the forms previously considered are replaced by black ones in the central line, and the central black spots are apparently continued forward and backward to the posterior margin. The species is said to be darkly colored, with nearly black abdomen. It is obviously distinct, and should be easily recognizable.

Psorophora agoggylia, new species.

Head uniformly covered with gray scales, rather sparse, showing the dark integument in places. Mesonotum with the central bare spaces separated from the short posterior ones by a line of gray scales; dorsal line of small black scales, mixed with rufous setae (Pl. IV, fig. 4). Abdomen with yellowish gray scales dorsally, a small black point on each side of the middle near the center of each segment; black lateral patches at the bases of the segments; venter black, with scattered light gray scales. Legs (and palpi) without outstanding scales, or with but slight roughness in places, the scales in general smooth and recumbent; femora pale reddish, the apical third black; tibiae black, with small whitish area at base; tarsi black, with white rings at the bases of the joints, broad on the hind legs, the first hind tarsal being half white. Wing membrane iri-

descent, strongly infuscated on the costal half; scales narrow and all dark.

Types, three females, No. 25755, U. S. Nat. Mus.; Gran Chaco, margin of the River Tapenaga, Colonia Florencia, Argentina, 1903 (E.-R. Wagner). The specimens were received from the Paris Museum, through M. E. Séguy, and others have been returned to that institution.

Allied to *holmbergii*, but differing in the absence of the two sublateral mesonotal black stripes, which are replaced by gray scales. The abdomen also is conspicuously pale-scaled and appears very light gray, not nearly black, as *holmbergii* is described.

Psorophora stigmatophora, new species.

Head clothed with light gray scales. Mesonotum with dense light gray scales, slightly yellowish, the median bare stripes strongly narrowed, linear, joining posteriorly in the antescutellar space; posterior bare spaces separated, the integument here black and polished; a small oval patch of black scales on each side of the middle; central lines of scales gray, tinged with golden anteriorly (Pl. IV, fig. 5). Abdominal scales light gray, but partly denuded in the material, precluding notation of details; ventral scales entirely light gray, sparsely placed. Palpi and legs with many coarse outstanding scales, especially on tips of femora and tibiae, black, mixed with pale; tarsi black, with broad whitish rings at the bases of the joints. Wings with the costal half very lightly infuscated; scales narrow, black, intermixed with whitish ones, especially along costal region.

In the male hypopygium the filament on the claspette differs in shape from that of *ciliata* and *tibialis*, being smaller, narrower, the tip not hooked, but ending in a little sharp spiral point. The claspers also differ, being narrower, with recurved margins, the two points at the tip subequal, curved laterally and parallel.

Types, two females and one male, No. 25756, U. S. Nat. Mus.; the females, Asunción, Paraguay, 1919 (Dr. Migone),

the male, Gran Chaco, margin of the River Tapenaga, Colonia Florencia, Argentina, 1903 (E.-R. Wagner). The females were sent by Dr. Juana Petrocchi, the male is from the Paris Museum by the kindness of M. Séguy. Another male and two females have been returned to Paris. Of these, one female bears the same data as cited; another, Gran Chaco, Loma Negra, north of Florencia and of Rio Tapenaga, 1903 (E.-R. Wagner); the male is labeled, Province of Santiago del Estero, Troncal, 40 kil. from Salavina, 1909 (E.-R. Wagner).

This is apparently the species identified by Lynch Arribálzaga as *Psorophora ciliata* (Rev. Mus. de La Plata, ii, 140, plate iv, fig. 3, 1891). If the bare spaces of my figure (Pl. IV, fig. 5) are made black, as is their actual color, the appearance of Arribálzaga's figure is reproduced. (See Pl. IV, fig. 6.)

A REVISION OF THE CHILOSINI

(Diptera, Syrphidae)

By RAYMOND C. SHANNON

In my recent paper, "A Reclassification of the Subfamilies and Genera of North American Syrphidae"¹ an attempt was made to reclassify the genera of the *Chilosinae*. Lately, while writing a synopsis of the *Chilosini*, supplementary characters have been found which may further aid to classify its subfamily. The facial tubercle is a striking characteristic of the *Chilosini*, but other genera of the *Chilosinae* have this structure and for this reason a key is given to all of the tuberculate face forms of this subfamily in order to prevent confusion.

It might be stated that the author has been more interested in discovering new group characters to use in classifying the *Syrphidae* than in discovering new species. A number of characters have been found in the *Chilosini* and because of their newness some word of explanation should be added.

¹ Bull. Brook. Ent. Soc., vol. xvi, 1921.

"*The ocelli.*" These as a rule are very uniform in their position on the frons, but in one species, *Chilosia catalina*, they are placed well forward of the line of the posterior eye margins. This is an imaginary line between the upper posterior corners of the eyes, following the general direction of the posterior eye margins. The position of the ocelli should prove of much use in classifying the *Microdontinae*, as it varies a good deal according to the species and even groups of species in this subfamily.

"*Antennal pits separated.*" In the hairy eyed *Chilosia* the lower median point of the frontal lunule extends well down between the antennae; and at the same time a chitinous projection of the face extends upward between the antenna and meets the downward projection of the frontal lunule. Thus a chitinous ridge is formed which separates the two antennal pits. This is a striking characteristic of the *Melanostomini* (Syrphinae).

"*Antennal pits confluent.*" There is a distinct break between the frontal lunule and facial projections so that the two antennal pits are confluent.

"*Pile on the head.*" The distribution of the pile on the head is of much importance in the Syrphidae and in the above mentioned paper is used to separate the *Eristilinae* from the *Xylotinae*. It can be used to fine advantage in the *Chilosinae*, e. g., the antennal frons is pilose in all of the tuberculate face forms except the subgenus *Barberiella*; *Chilosia* (sensu stricto) has hairy eyes; and the *Chrysogasterini* and about half of the species of *Chilosia* and one species of *Cartosyrphus*, *sialia*, have the face pilose.

"*Face pilose (or hairy).*" This term is intended to mean (in accordance with Becker and Verrall) that the face bears fairly long, distinct pile other than the very fine pollinosity, and the pile on the lateral facial strips.

"*Lateral facial strips.*" The lateral sides of the face in *Chilosini* have a more or less elongate groove separating a more or less broad strip from the rest of the face. These have been called "eye margins" by Becker and Verrall.

"Lower posterior margin of scutellum with downward projecting hairs or pile." Sometimes the lower surface of the scutellum has fairly abundant pile (*Chilosini*) ; in certain groups of *Chrysogaster* and in *Apicomylia* there is a single row of fine silky hairs. Other genera treated here are without this character.

"Apical cross-vein forming right angles with the third vein." The apical cross-vein changes its oblique course on its distal end and turns upward, meeting the third vein vertically. The upper distal corner of the first posterior cell is in form of a right angle, likewise its complement.

"Apical cross-vein forming an acute angle with the third vein." The apical cross-vein continues its oblique course until it meets the third vein. The first condition tends to be more of the *Chilosinae* type, and has its extreme in the *Chrysogaster* where it is even recurrent on its distal end. It occurs in a number of the *Chilosini* and in *Hammerschmidtia*. *Microdontinae* also has this type of venation. The acute upper distal corner of the first posterior cell is more characteristic of the *Xylotinae* but occurs in a number of the *Chilosinae* as well.

"Petiole beyond union of apical cross-vein and third vein longer than length of discal cross-vein." This character at once segregates the *Chrysogasterini*, *Chilosini* and *Hammerschmidtia* from the other tuberculate *Chilosinae*.

"Petiole beyond union of apical cross-vein and third vein shorter than length of discal cross-vein." Occurs in the *Myioleptini*. Another way of saying the upper distal corner of first posterior cell is acute and close to the wing margin.

"Pile on sternopleura." The distribution of the pile on the sternopleura is dependent upon the development and movements of the middle legs. Usually the upper third or fourth region and the apex or lowest point is pilose and a bare smooth space lies between. Malloch has pointed out that in *Sphegina* the sternopleura is bare, while in *Neoascia* the upper margin is pilose, which is a good character for separating these closely allied genera.

"Pile on the posterior antecoxal piece." The posterior antecoxal piece is that part of the venter of the thorax between the middle and the hind coxae. It is pilose in the *Chilosini*, *Apicomymia*, *Myiolepta nigra*, *Rhingia*, *Ferdinandea*, *Callicera*, *Psilota*, and *Pipizini*. It is bare in *Eumyiolepta*, *Myiolepta varipes*, *Chalcomymia*, *Hammerschmidtia*, *Brachyopa*, *Pelecocerini*, *Sphegini* and apparently all the species of *Chrysogaster*. Thus this character is, as in *Xylotinae*, usually only of specific importance.

The *Chilosinae* may be circumscribed by their pilose humeral calli (i. e., pile on the humeri as long as elsewhere on mesonotum); males always with four visible tergites (exclusive of the hypopygium); discal cross-vein placed before middle of discal cell; costal vein ending at or beyond apex of wing; third antennal joint with dorsal arista except *Callicera* and *Pelecocera*.

KEY TO THE GENERA OF CHILOSINAE WITH TUBERCULATE FACE

1. Antennae very elongate with terminal style.....*Callicera*
Antennae with dorsal arista.....2
2. Discal cross-vein at or beyond middle of discal cell; general color brassy*Ferdinandea*
Discal cross-vein before middle of discal cell.....3
3. General color ferruginous; thorax, legs and abdomen with bristles*Hammerschmidtia*
General color dark.....4
4. Petiole beyond union of third and fourth veins as long as length of discal cross-vein.....5
Petiole beyond third and fourth veins much shorter.....7
5. Eyes hairy; antennal pits separated.....*Chilosia*
Eyes bare; antennal pits confluent.....6
6. Face bare; both sexes with prominent facial tubercle...*Cartosyrphus*
Face with pile; males only with tubercle which is very small*Chrysogaster* (in part)
7. Pile modified, scale-like.....*Eumyiolepta*
Pile normal.....8
8. Posterior femur with a saw-tooth projection on outer, apical end.....*Apicomymia*, n. gen., type *Myiolepta bella* Will.
Posterior femora without such structure.....*Myiolepta*

DEFINITIONS OF THE GENERA

Chrysogaster Meigen: Certain males (e. g., *nigripes*, *texana*, *greeni*, *inflatifrons*, *nigripennis*, *versipellis*, *chilosoides*) have a small inconspicuous facial tubercle. Frons and a patch on each side of face faintly rugulose; eyes bare; face with scattered pile; lower posterior edge of scutellum without downward projecting pile (present in *chilosoides*, *nigripennis*, *versipellis*, and *alaskensis*); outer edge of scutellum tends to be marginate; dorsal surface of abdomen flattened, opaque, the sides shining; the petiole beyond the union of the third and fourth veins longer than length of discal cell; thorax without bristles.

Callicera Panzer: Antennae very elongate, bearing a terminal style (in others of this group the antenna is of normal length and bears a dorsal arista); eyes, face and upper surface of squamae pilose; lower posterior edge of thorax with downward projecting pile; face inconspicuously tuberculate, thorax without bristles.

Ferdinandea Rondani: General color brassy; eyes and face pilose; thorax with numerous bristles; discal cross-vein joining discal cell at or beyond middle; lower posterior edge of scutellum with downwardly hanging pile; lower sides of tarsi without short bristles; petiole of third and fourth veins as long as discal cross-vein.

Chilosia Meigen: Both sexes with prominent facial tubercles; eyes hairy; face bare (subgenus *Chilosia*); face hairy (new subgenus *Chilomyia*, type *occidentalis* Will.); a distinctly chitinized projection of the face proceeds upward between the antennae to meet a downward projection of the frontal lunule, thus separating each antenna and enclosing each with a chitinous rim; thorax usually with bristles; scutellum not marginate, the lower posterior edge with abundant downward projecting pile; discal cross-vein placed well before middle of discal cell; petiole beyond union of third and fourth veins as long as length of discal cross-vein.

Cartosyrphus Bigot: Differs from the above in having eyes and usually face bare; antennal pits confluent. Subgenus

Hiatomyia Shannon: Arista with long plumosity. Subgenus *Cartosyrphus* Bigot: Arista short pubescent, or bare.

Hammerschmidtia Schummel: General color ferruginous; frontal aspect of head appearing triangular; face tuberculate in male; thorax, legs and abdomen bearing black bristles; petiole beyond third and fourth veins longer than length of discal cross-vein.

Myiolepta Newman: Males only tuberculate; scutellum marginate, lower posterior surface bare; all the femora somewhat swollen, spinose below; apical cross-vein joining third vein nearly at wing margin, the petiole beyond being about one-fourth the length of discal cross-vein; the second vein turning up sharply at its distal end, joining the costa before the middle of the space between the tips of the first and third vein.

Eumyiolepta Shannon: Differs from *Myiolepta* in having the facial and body pile modified into whitish scales.

Apicomylia, new genus; type *Myiolepta bella* Will.: Differs from *Myiolepta* in having the shape of the head, viewed from the frontal aspect, distinctly triangular; facial tubercle inconspicuous but present in both sexes; scutellum faintly marginated, lower posterior edge with a row of downward projecting fine hairs; second vein but slightly turned up at its tip and joining the costa well beyond the middle of the section between the first and third veins; hind femora greatly enlarged, with a prominent sawtoothed projection on the outer apical end.

Chrysogaster Meigen, subgenus **Barberiella**, new.

Frons bare; face with fairly abundant pile; second antennal joint above and below with bristles greater in length than third antennal joint; face tuberculate in male; lower posterior edge with a single row of downward projecting pile; anal vein beyond anal cell short, being little longer than discal cross-vein; apical cross-vein directed outward.

Named after Herbert S. Barber, who has on many occasions proven his exceptional ability to collect rare insects.

Type: *Barberiella chilosoides*, new species.

Barberiella chilosoides, new species.

Male. Rather small, but fairly robust species; shining black, with a steel blue reflection on abdomen; pile everywhere black except on anterior corners and lateral margins of abdomen where it is luteous.

Frons flattened, rugulose, with a shallow, median, longitudinal impression; face clothed with black pile from base of antennae to oral margins except for a broad bare median patch; epistoma small, well rounded, situated about its own length above the frontal oral notch. Face noticeably longer than broad and, in line with base of tubercle, very slightly and evenly concaved from antennae to oral notch. Pile on scutellum fairly long, longer and coarse on the margin. Pleurae with fairly long dense pile. Middle and hind coxae with strong, black pile. Squamae, squamal cilia and halteres brown. Length 7.5 mm.; wing 6.5 mm.

One male, Eureka, California, June 2 (H. S. Barber).

Type.—Cat. No. 25387, U. S. Nat. Mus.

Barberiella versipellis Will. (described as a species of *Chilosia* by Williston) is very closely related. It differs in having the face nearly as broad as long, deeply concaved between epistoma and tubercle; facial pile shorter and more scattered. Wings smoky. Genitalia styles longer and narrower.

These two species form a unique group in *Chrysogaster*. They approach *Chilosia* very closely and as all of their characters, except the rugulose patches on the face, the bare frons and flat abdomen, seem to be repeated in one or another of the species of *Chilosini* it is rather difficult to separate them. The general habitus allies them much more to *Chrysogaster*. Moreover, the females probably will prove to have no tubercle on the face, another character which would ally them to *Chrysogaster*. In fact a female specimen determined as *Chrysogaster lata* Loew and compared with the type of that species by Williston may prove to be the female of *B. versipellis* Will. This specimen was characterized in my paper on *Chrysogaster* (Proc. Ent. Soc. Wash., 1915) as "Group 3." The males of

Barberiella agree in having the tip of the fifth vein extending slightly beyond the tip of the first vein. This character was stated in my paper "stigma shorter than distance between the tips of the first and third veins." In *chilosoioides* these distances are about the same but the wording of the character may be changed to tip of fifth vein extending beyond tip of first vein and will serve to further separate groups 3 and 4.

***Chrysogaster alaskensis*, new species.**

A very large species for *Chrysogaster*, uniformly blackish aeneous; dorsum of abdomen shining.

Female.—Frons broad but little widening from posterior margin to antennae, faintly, but widely rugulose; clothed with black pile except on antennal front (i. e., a fairly wide stripe just above the antennae and comprising the lower sixth of the frons); antennae jet black; second joint bearing bristles above and below, one of the upper ones being greater in length than width of second joint; arista nearly equal to width of frons, pubescent; face flat, slightly receding, epistoma well developed, bearing pile only on the sides, the epistoma and the jowls.

Mesonotum with two median faint stripes anteriorly; pile largely black with a little luteous intermixed; scutellum with fairly long, rather coarse black pile, the lower posterior border with downward projecting luteous pile; pleurae with black pile, becoming light colored on upper region of sternopleura.

Legs black, pile ranging from black to light golden.

Dorsum of abdomen somewhat flattened, shining black aeneous, somewhat opaque on middle of second and third segments, clothed with pale pile.

Wings a little smoky, stigma dark brown. Apical cross-vein forming an acute angle with the third vein; tip of fifth vein extending beyond tip of first vein; petiole beyond anal cell shorter than length of discal cross-vein. Squamae and plumula yellowish white; halteres reddish yellow.

Length 8.5 mm.; wing 7.5 mm.

Type.—Cat. No. 25386, U. S. Nat. Mus.

Two females: Anchorage, Alaska, June 11, 1921 (type), and Valdez, Alaska, June 8, 1921 (J. M. Aldrich).

This striking species apparently comes in the subgenus *Barberiella*, as is evidenced by the bare antennal frons (this seems to be the counterpart of the bare frons in the males of *chilosoides* and *versipellis*), the projecting hairs on the lower posterior margin of the scutellum and the venation. If this proves to be the case it would bear out my belief that the females of tuberculate-faced male *Chrysogasterini* in all cases have no tubercle.

Tribe CHILOSINI

The genus *Chilosia* is one of the largest of the Syrphid genera in Europe. Becker in his revision of the European forms treats one hundred and forty species. In Williston's Synopsis of Syrphidae there are twenty species recorded from North America. Three of these have been placed in other genera and one has been found to be the female of a previously described species. In the present paper an equal number of additional species have been described which, with what have been recognized in recent years, swells their number to fifty. Of the new species described since Williston's synopsis a large proportion (ten) have been collected by Dr. J. M. Aldrich, most of them in Idaho. Another collector who has added to the museum collection considerable material in *Chilosia*, not only of collected but also of reared material, is Mr. H. E. Burke, of the Bureau of Entomology. Mr. Burke tells in one of his recent papers that seventeen years ago Dr. E. A. Schwarz showed him the single specimen of *Trachykele* (Coleoptera) possessed by the National Museum and said: "Do not bring in the common things. Get the rare ones, get the rare ones." Since that time over a hundred specimens of the four named species have passed through Burke's hands, and the Museum now has the most representative collection of *Trachykele* in the world. And he adds, "All from the deep impression made on the mind of a young collector by the inspiring words of Dr. Schwarz."

Mr. Burke has shared some of his success as a collector with

the *Chilosia*, and has worked out the life history of some of the species causing black check in the western hemlock. He bred *Chilosia hoodiana* from *Abies concolor* and *grandis*; and *C. burkei* from *Tsuga heterophylla*. This latter species was determined as *Cheiloscia alaskensis* Hunter by Coquillett.

Until a few years ago the hairy eyed species of *Chilosia* were considered to be almost entirely of western distribution in North America. About half a dozen species are now known to occur in the eastern United States.

In this study the writer has separated the *Chilosia* (old sense) somewhat after the manner of Becker, according to the pilosity of the eyes and face.

He has supplemented the character of "eyes hairy" with the character "antennal pits separated," and has considered the species having these characteristics as forming the genus *Chilosia* and for those with "eyes bare" and "antennal pits" confluent he has resurrected Bigot's generic name *Cartosyrphus*. This makes nearly an even division of our North American species.

Unfortunately the type species of *Chilosia*, *flavipes*, has the eyes sometimes bare in the female but the writer believes that this species will be found to have the antennal pits separated, which would put the genus *Chilosia* on a better basis.

Each of these genera may be further divided into two subgenera. The *Chilosia* with hairy face are considered as forming the subgenus *Chilomyia*; those with bare face form the subgenus *Chilosia*. *Cartosyrphus* is divided by arista long plumose, subgenus *Hiatomyia*, and arista short plumose, subgenus *Cartosyrphus*. There are other smaller groups of species containing closely allied forms, which are distinct from the other species, such as the *comosa* group which have the frons and face very broad, the arista very short and thorax without bristles, but it would avail nothing to consider such groups as subgenera.

The pile on the face apparently makes an arbitrary division in *Chilosia*, as among the hairy faced forms there are some which are closely related to the bare faced forms. However,

it is an excellent specific character, for it is constant in a species where it occurs. About the only exception to this occurs in *nigrovittata*. The facial pile is very sparse in this species and in some specimens it appears altogether absent. For this reason *nigrovittata* is keyed in both the face bare and face pilose groups. Good supplementary specific characters are found in the described species so there is very little chance for duplication of species in the two subgenera as they now stand. Another character of considerable interest in this group is the shining, deep blue color of certain species. This color occurs sporadically in quite a number of cases in unrelated species in both genera. Altogether eight species are so colored in this tribe.

The sexual dimorphism is so great in the Chilosini that the sexes are best keyed separately. Very often species which key close together are from widely separated parts of the country. For this reason localities are given in the keys.

- A. Eyes hairy; antennal pits separated (type *flavipes*).....*Chilosia*.
 - a. Face bare.....subgenus *Chilosia* males 1, females 1
 - aa. Face hairysubgenus,
 - new (type *occidentalis* Will.) *Chilomyia* males 13, females 17
- B. Eyes bare; antennal pits confluent.....*Cartosyrphus*.
 - Arista long plumose..... sub-
 - genus, new (type *willistoni* Snow). *Hiatomyia* males 1, females 1
 - Arista pubescent to bare,
 - subgenus (type *pagana*) *Cartosyrphus* males 8, females 12

CHILOSIA—MALES

Eyes hairy; antennal pits separated

- 1. Face bare.....subgenus *Chilosia* 2
- Face hairy.....subgenus *Chilomyia* 13
- 2. Large (about 12 mm.), robust species, clothed with long pile;
 - no bristle-like hairs on thorax; head triangular in shape;
 - posterior cross-vein as long or longer than ultimate section
 - of apical cross-vein.....3
 - Pile short, usually bristle-like hairs present on thorax; head
 - broadly oval; posterior cross-vein shorter than ultimate sec-
 - tion of fourth vein.....6
- 3. Shining bronze species, with abundant golden pile (Mexico)
 - chrysochlamys* Will.
 - Not shining bronze4

4. Abdomen shining steel blue; third and fourth segments with black pile (California, Washington).....*chalybescens* Will.
Abdomen blackish with pale yellow or brownish pile.....5
5. Tibiae and tarsi largely yellow, face but little protruding downward (*lasiophthalma* complex Alaska, Washington, Oregon, Colorado, New Hampshire, North Carolina),
lasiophthalma Will.
Tibiae largely black; face much protruding downward (Oregon, Washington).....*ferruginea* Lovett.
6. Fore coxa with a short, but distinct, spur on outer anterior corner (western America spp.).....7
Fore coxa without spur.....8
7. Legs entirely black (Idaho).....*aldrichi* Hunter.
Apices of tibiae yellowish (Brit. Col.; Idaho)....*columbiae* Curran.
8. Pile on pleurae luteous; no bristle-like hairs on thorax (Idaho)¹.....*florella*, n. sp.
Pleural pile black; bristle-like hairs on alar callosities and scutellum9
9. Small species, 7-8 mm.; antennae black (Alaska).....*borealis* Coq.
Larger species, 10-12 mm.; antennae usually not pure black.....10
10. Antennae and legs, including pile on the legs, entirely black; wings smoky (Massachusetts)*hiawatha*, n. sp.
Antennae brown or reddish yellow; pile on coxae whitish or luteous11
11. Wings rather strongly infuscated; dorsum of thorax with a well defined band of black pile; face usually with a few long hairs (Oregon, Washington).....*nigrovittata* Lovett.
Wings but little infuscated; pile on mesonotum concolorous.....12
12. Face scarcely concaved between antennae and tubercle. See female (Ontario, New York, New Hampshire, North Dakota).....*orilliaensis* Curran
Tubercle very large and convex (California).....*baroni* Will.
13. Thoracic pile black, the pile on the venter alone being pale; general color dark blue (Washington).....*burkei*, n. sp.
Pleural pile more or less light colored; general color black, or greenish black14
14. Legs distinctly bicolored; arista shorter than width of frons measured across lunule; mesonotal pile entirely luteous (eastern United States).....*primoveris* Shann.
Legs black, merging into dark brown; arista as long as, usually longer than, width of frons; mesonotal pile usually brownish or partly black.....15

¹*C. hunteri* Curran (Manitoba, Canad, Ent., May, 1922) probably comes here.

15. Dorsum of thorax with well defined band of black pile (face sometimes without long hairs; see bare face section) (Oregon, Washington).....*nigrovittata* Lovett.
Thorax without such band.....16
16. Face distinctly excavated between antennae and tubercle.....17
Face but slightly excavated.....18
17. Arista about as long as width of frons measured across base of antennae; face broader than one-third width of head (Idaho, Washington, Oregon)...*petulca* Will. and *hoodiana* Bigot. (Abdomen yellowish=*hoodiana-flaviabdominalis*, n. var.)
Arista very long, exceeding width of frons; face about one-third width of head (Europe; reported from Alaska),
variabilis Panz.
18. Arista shorter than width of frons; medium sized species (Alaska)*yukonensis*, n. sp.
Arista slightly longer than width of frons; robust species (*pacifica* and *occidentalis* complex).....19
19. "Thickly white pilose species" (California).....*pacifica* Hunter.
Thorax with intermixed black and brownish pile (California, New Mexico, Colorado, Alaska).....*occidentalis* Will.

CHILOSIA—FEMALES

Eyes hairy; antennal pits separated

1. Face bare.....Subgenus *Chilosia* 2
Face hairySubgenus *Chilomyia* 17
2. Frontal view of outline of head triangular shaped; posterior cross-vein longer than distance from its tip to tip of apical cross-vein. Large, usually very long pilose species.....3
Frontal view of head broadly oval in outline; posterior cross-vein shorter than distance from its tip to tip of apical cross-vein; short pilose species.....8
3. Shining bronze, with abundant golden pile (Mexico),
chrysochlamys Will.
Not shining bronze.....4
4. Abdomen shining steel blue; third and fourth segments with black pile (California, Washington).....*chalybescens* Will.
Abdomen blackish5
5. Arista distinctly shorter than width of frons measured across antennae; pile rather short (Idaho).....*julietta*, n. sp.
Arista longer than width of frons.....6
6. Face, much produced downward, cone-like; legs largely black with long pile (Oregon, Washington).....*ferruginea* Lovett.
Face rather moderately produced downward.....7

7. Abdominal pile short, black on posterior half; middle tibiae and tarsi largely black; hind legs with short pile (Idaho),
bicolorata, n. sp.
 Abdominal pile concolorous with that on thorax; legs largely black; hind legs with short pile (*lasiophthalma* complex) (Colorado, New Mexico, Alaska, New Hampshire, North Carolina).....*lasiophthalma* Will.
8. Fore coxa with a short but distinct spur on outer anterior corner (western America).....9
 Fore coxa without spur.....11
9. Legs entirely black.....*aldrichi* Hunter.
 Legs partly yellow10
10. Female with erect pile of normal length on mesonotum; length 10-12 mm. (Brit. Col., Idaho).....*columbiae* Curran.
 Female with short depressed pile on mesonotum; length 7-8 mm. (Colorado).....*aldrichi-pikei*, n. var.
11. General color steel blue; apical cross-vein forming an acute angle with the third.....12
 General color shining greenish black or black; apical cross-vein bending upright on its distal end and meeting the third in a vertical position, thus forming right angles.....13
12. Pile on pleurae and coxae black (Alaska).....*alaskensis* Hunter.
 Pile on pleurae partly pale; coxae with pale pile (Oregon, Washington)*burkei*, n. sp.
13. Pleurae with black pile and bristles mixed with the light; antennae black; length 7.5 mm. (Alaska).....*borealis* Coq.
 Pleurae with only light colored pile; 9-11 mm.....14
14. "Everywhere profoundly punctured; wings uniformly, distinctly yellowish." Pile on front and mesonotum pale, short (Nebraska)*punctulata* Hunter.
 Not unusually punctured15
15. Face becoming much wider than the front, half the width of face, i. e., from tip of oral notch to the eye margin, much wider than width of front measured across ocelli; antennae reddish yellow (Idaho).....*florella*, n. sp.
 (*C. sororia*, Mexico, with its red antennae and bristleless scutellum probably comes here.)
 Front and face widening evenly from ocelli to lower corners of eyes, half the width of face but little greater than width of front across ocelli.....16
16. Scutellum without bristles; pile whitish, fairly long and abundant, giving species a grayish appearance; antennae brown (California)*baroni* Will.

- Scutellum with long, slender bristles; pile rather sparse, species appearing shining black (Ontario, New York, New Hampshire, North Dakota).....*orilliaensis* Curran.
17. Antennae bright reddish yellow.....18
 Antennae dark brown21
18. General color dark steel blue; thoracic pile largely black.....19
 General color greenish black; thoracic pile luteous (Washington, Idaho, Oregon).....*petulca* Will.=*hoodiana* Bigot.
19. Halteres dark brown; pile on pleurae and scutellum largely luteous (New Mexico).....*sonoriana*, n. sp.
 Halteres reddish yellow; scutellar pile mostly black.....20
20. Pleural pile mostly black; scutellar pile short; head higher than broad, small species (New Hampshire).....*pontiaca*, n. sp.
 Pleural pile equally luteous and black; scutellar pile long; head broader than high; medium sized species (Oregon, Washington)*burkei*, n. sp.
21. Legs entirely black (Europe).....*variabilis* Panz.
 Legs partly brown or black.....22
22. Apical cross-vein sinuate; tibiae yellow with medium broad black bands; small, eastern species (Virginia, Maryland, Pennsylvania)*primoveris* Shann.
 Apical cross-vein parallel with wing margin except on distal end where it is turned upright; tibiae black and brown (western species).....23
23. Arista shorter than width of frons measured across base of antennae (Alaska)*yukonensis*, n. sp.
 Arista equal to width of frons (California, Colorado, New Mexico)*pacifica-occidentalis* complex.

CARTOSYRPHUS—MALES

Eyes bare; antennal pits confluent

1. Arista with long, or dense, plumosity which can be perceived with naked eye (subgenus *Hiatomyia*).....2
 Arista very short plumose to bare (subgenus *Cartosyrphus*).....8
2. Arista very densely plumose for more than one-half its length; third antennal joint large, bright yellow; mesonotum with long black hairs intermixed with the luteous pile (Idaho),
signatiseta Hunter.
 Arista with long, loose rays.....3
3. Thorax shining deep steel blue.....4
 Thorax black or greenish black.....5
4. Face less than one-third the width of the head; facial strips very narrow (eastern North America),
plumata Lw. and *cyanescens* Lw.

- Face greater than one-third the width of head; facial strips broad (Idaho, Washington).....*cyanea* Hunter.
5. Face distinctly longer than wide; pteropleura, besides the long black bristles, with yellowish pile (California)..*townsendia* Hunter.
Face about as broad as long; pteropleura clothed with coarse black hairs6
6. Anterior corners of second tergite with black pile; beyond this the lateral abdominal pile is luteous (California)..*willistoni* Snow.
Sides of second tergite entirely black pilose; third and fourth tergites with alternating black and white patches.....7
7. Halteres and basal parts of wings infuscated; third antennal joint reddish brown (Alaska).....*plutonia* Hunter.
Halteres yellow; wings hyaline; third antennal joint black with a reddish brown spot (Idaho).....*idaho*a, n. sp.
8. Margin of scutellum with bristles.....9
Margin of scutellum without bristles.....19
9. Face clothed with scattered pile; shining, very dark blue species (New Brunswick).....*sialia*, n. sp.
Face without pile except on lateral strips, general color black, or greenish black.....10
10. Entirely black, including legs and antennae.....11
Tibiae and tarsi partly reddish brown.....12
11. Squamæ with white cilia (Oregon, Washington).....*laevis* Bigot.
Squamæ with blackish cilia (Colorado). Recorded as *laevis*
Bigot by Jones, but may prove to be the male of *lucta* Snow..*lucta*?
12. Antennal pits separated; squamæ white with white cilia.....13
Antennal pits confluent.....15
13. Lateral facial strips about three times diameter of arista (Europe)*pulchripes* Lw.
Lateral facial strips much broader.....14
14. Apical cross-vein turning upward, forming right angles with third vein (Alaska)*hesperia*, n. sp.
Apical cross-vein forming an acute angle with third vein (Alaska)*kincaidia*, n. sp.
15. Femora largely yellow (Virginia, Maryland, New Jersey, New Hampshire)*pallipes* Lw.
Femora black with yellowish apices.....16
16. Hind metatarsus swollen, larger than posterior tibia; third antennal joint reddish yellow (Virginia, Maryland, Pennsylvania, New Jersey, New York).....*similis* Shann.
Hind metatarsus equal in girth to hind tibia.....18
17. Arista bare (apparently closest related to *pallipes* group), (Ontario).....*ontario* Curran.
Arista pubescent18

18. Northern species (*tristis* complex).....*tristis* Lw.
Southwestern species (see ♀).....*sororocula* Will.
19. Arista noticeably longer than width of frons measured at antennae; scutellum with a transverse, shallow groove running parallel with posterior margin.....20
Arista much shorter than width of frons measured at base of antennae21
20. Pile on frons and mesonotum luteous; styles very long and slender; costa, from base to tip of auxiliary vein, with conspicuous long black hairs (Virginia, District of Columbia, Maryland, Pennsylvania)*capillata* Loew.
Pile on frons and anterior corners of mesonotum black; inconspicuous hairs on costa except at base, styles short and broad.....*slossonæ*, n. sp.
21. Frons nearly bare (Nebraska).....*laevifrons* Jones.
Frons well clothed with long pile.....22
22. Only a slight trace of silvery pruinosity on frons, the pile dark (Colorado).....*tarda* Snow.
Pile on frons light, the silvery pruinosity very apparent when specimen is held in proper reflection.....23
23. Pile on anterior part of mesonotum as long as pile on frons (Colorado)*brevichaeta*, n. sp.
Pile on mesonotum half as long as on frons.....24
24. Head greatly enlarged (Indiana).....*caltha*, n. sp.
Head moderately enlarged (Canada).....*comosa* Lw.

CARTOSYRPHUS—FEMALES

Eyes bare

1. Arista with very long loose, or very dense plumosity; scutellum with bristles.....*Hiatomyia* 2
Arista short plumose, pubescent or bare.....*Cartosyrphus* 12
2. Arista thickly plumose; pile on mesonotum largely luteous (*signatiseta* group).....3
Arista with scattered long rays; pile on mesonotum largely black...5
3. Third antennal joint unusually large, about fifteen times that of the second, and bright yellow in color; arista very densely plumose (Idaho).....*signatiseta* Hunter
Third joint only half this size, or less; arista less thickly plumose..4
4. Mesopleurae with only light pile; mesonotum with a near golden colored pile, the scutellar bristle hairs concolorous (British Columbia)*canadensis*, n. sp.
Mesopleurae with tuft of long, coarse black hairs; pile of mesonotum duller in color; black bristle-like hairs on scutellum (Colorado)*gemini*, n. sp.

5. Legs largely yellow; face usually more or less yellow.....6
Legs largely black; face black.....7
6. Scutellum partly yellowish; mesonotum brassy black (California)*townsendia* Hunter.
Thorax entirely steel blue (northeastern America),
plumata Lw.; *cyanescens* Lw.
7. Shining blue species; third antennal joint bright reddish yellow (Oregon: *nigro-coerulea* Lovett; Washington),
cyanea Hunter.
Shining black species.....8
8. Pile on dorsum of thorax black; tubercle prominent; third antennal joint reddish yellow (Alaska).....*gracilis* Hunter.
Pile on mesonotum at least partly luteous or whitish.....9
9. A tuft of black bristle-like hairs on the pteropleura, as well as mesonotum (Alaska).....*plutonia* Hunter.
Only light-colored pile on pteropleura.....10
10. Arista shorter than width of frons at antennae; legs solid black; length 65 mm. (Nevada).....*plumosa* Coq.
Arista as long or longer than width of frons.....11
11. Frons with luteous pile; length 6.5 mm.....*idahoae*, n. sp.
Frons with black pile; length 8 mm. (California)..*willistoni* Snow.
12. Scutellum with bristle-like hairs, usually black.....13
Scutellum at most with a few long pale hairs.....20
13. Face, humeri and scutellum more or less yellowish.....14
Face and thorax black.....16
14. Arista very finely pilose; dorsum of thorax punctulate; posterior femora light-colored at apex only; black, moderately shining species (Carolina).....*leucoparea* Lw.
Arista noticeably pubescent; greenish black species.....15
15. Legs almost entirely yellow, yellow markings of face and thorax bright lemon yellow (District of Columbia)..*pallipes* Lw.
Legs with more or less black; yellow markings of more or less obscured color (northern North America: *tristis* complex)*tristis* Lw.
16. Third antennal joint very large, six times or more than that of the second, and bright orange (Alaska).....*kincaidi*, n. sp.
Third joint not half so large.....17
17. Tarsal joints dilated, particularly the posterior ones; pile everywhere pale, even the scutellar bristles (Arizona, Mexico)*sororocula* Will.
Tarsi not dilated, bristles black.....18
18. Entirely shining black (Washington) *laevis* Bigot; (Colorado) *lucta* (?) Snow. Other characters for *lucta* are:

- Arista about equal to width of frons measured at base of antennae; third antennal joint subquadrate, blackish...*lucta* Snow.
Antennae reddish yellow to brown; tibiae and tarsi partly brown; arista about one and half times width of frons.....19
19. Length of frons about twice its width; arista noticeably pubescent; hind metatarsus thickened (Virginia, Maryland, Pennsylvania, New Jersey, New York).....*similis* Shannon.
Length of frons nearly three times its width; arista very faintly pubescent; hind metatarsus equal in girth to tibia (Ontario).....*rita* Curran.
20. Legs and antennae entirely black (Colorado).....*lucta* Snow.
Legs and antennae partly yellowish.....21
21. Scutellum with a distinct groove-like depression near apical border; arista much longer than width of frons; third antennal joint enormous.....22
Scutellum with an evenly convex surface; arista much shorter than width of frons.....24
22. Legs almost entirely yellow (Pennsylvania).....*prima* Hunter.
Femora, except their apices, black.....23
23. Third antennal joint as broad as distance between root of antennae and eye margin, and with a distinct slit on inner surface (Virginia, Maryland, Pennsylvania).....*capillata* Lw.
Third joint much broader than this distance and without a slit (New Hampshire).....*slossoni*, n. sp.
24. Third antennal joint longer than broad, brownish (Indiana),
caltha, n. sp.
Third joint circular25
25. Frons flattened; shining black species (Canada).....*comosa* Lw.
Frons not flattened, trisulcate.....26
26. Third joint reddish yellow; general color shining aeneous (Colorado)*brevichaeta*, n. sp.
Third joint brown; general color shining black (Colorado),
tarda Snow.

INDETERMINATE SPECIES

There are two described species which the author is uncertain of regarding their position in the key, hence are given here with what appears to be their salient characters.

Chilosia chintimini Lovett (Proc. Cal. Acad. Sci. XI, 15, 1921).

Male.—Eyes pilose, face hairy; no bristles anywhere. Nearly black with mostly black pile. Similar to *ferruginea* and *lasi-*

ophthalma in size and length of pile, but its uniform black color separates it. (Probably is close to *nigrovittata*.)

Chilosia skinneri Johnson (Trans. Am. Ent. Soc., 29, p. 101, 1902).

Eyes bare; sides of face yellow and covered with whitish pubescence, leaving a broad, shining medial stripe; antennae reddish, upper edge of third joint dark brown; arista bare. Thorax black, dorsal portion shining and sparsely covered with very fine white hairs; humeri with a whitish bloom; pleurae with a tuft of white hairs in front of the wing base; scutellum with two slight bristles; halteres white. Legs, including coxae, uniformly light yellow. Length 5.5 mm.

May belong to *tristis* group but may prove to be a member of the *Syrphinae*.

Chilosia robusta Hine (Ohio Journ. Sci., p. 144, 1922).

Curran writes me that he believes this species to be the same as his *C. columbiae*.

Chilosia sonoriana, new species.

Shining, dark bluish black species. Eyes and face hairy; scutellum with bristles.

Female.—Shining, dark bluish black with short pile. Antennae bright yellow, third joint rounded; arista blackish, microscopically pubescent. Face shining bluish black, thinly clothed with fine, pale and black hairs; deeply concaved below antennae, tubercle protrudes noticeably beyond antennal prominence; epistoma a little produced beyond antennal base; eye margins narrow, with short pale pile. Mesonotum with short, blackish pile, on the lateral margins with rather long black hairs; a few bristles on postalar calli; pleurae with thick whitish and black pile; scutellum with pale pile and black marginal bristles. Legs black except the apices of the femora and the bases of the tibiae which are brownish. Abdomen shining, dark bluish black with very short pale and dark pile, on the sides longer and all pale. Wings large with a smoky tinge; stigma dark luteous; veins black. Squamae dirty yellowish with a

brownish margin and pale yellow cilia; halteres reddish black. Length 9 mm.; wing 9 mm.

Type.—Cat. No. 25377, U. S. Nat. Mus.

Described from two females; Las Vegas, New Mexico, June, 1901, 11,000 feet altitude (T. D. A. Cockerell).

Among the species of *Chilomyia*, *catalina* is closest related to *sonoriana* but has a much less prominent face.

***Chilosia catalina*, new species.**

Female.—Medium size, rather robust species, entirely shining steel blue color; eyes hairy; face bare; scutellum with bristles; apical cross-vein forming an acute angle with the third vein; arista a little longer than width of frons measured at base of antennae; ocelli set well before the posterior corners of the eyes; frons with rather sparse and fairly stiff black pile; frons and face fairly broad, their lateral margins widening evenly to lower corner of eyes; antennae bright reddish yellow; third joint about five times as large as the second; arista reddish yellow at base, darkening outwardly, pubescent. Mesonotum with short luteous pile and short stiff black hairs intermixed, and bristles near the wing bases; pleurae with whitish pile and no bristles. Femora black, yellowish at apex; tibiae brownish, becoming lighter at their apices and bases; tarsi brownish. Abdomen with only whitish pile. Wings reddish yellow at base and lutescent throughout; squamae pale reddish yellow; halteres reddish yellow. Length 9.5 mm.; wing 8.25 mm.

Type.—♀, Cornell University collection.

Collected at Webber's Cabin, Mount Lemon, Santa Catalina Mountains, Arizona, July 27, 1917, by J. C. Bradley of the Cornell Biological Expedition. Other specimens in the Cornell collection and one in the Biological Survey collection.

Chilosia alaskensis Hunter is its nearest ally of the bare faced *Chilosia*. It differs from *C. catalina* by having the ocelli placed in line with the posterior margins of the eyes; a noticeably broader frons and face, the arista is shorter than the width of the frons; the upper edge of the third antennal joint is blackish; the arista brownish throughout; pile on the meso-

notum composed only of rather short stiff black hairs; pile on the pleurae is black; darker legs; and black pile on abdomen.

In spite of the fact that the face is bare and the general color is black *C. hoodiana* appears to be its closest ally. However, there are a number of specific differences which serve to separate them. *C. hoodiana* (♀) has the face broader and somewhat produced downward, a shorter arista and costal bristles (i. e., just beyond the base of costa) of moderate length, noticeably shorter than length of discal cross-vein; whereas in *catalina* these bristles are unusually long, some being longer than length of discal cross-vein. *C. burkei* is distinguished from it by its somewhat downward produced face, and entirely dark legs, as well as its pilose face.

***Chilosia hiawatha*, new species.**

Male.—Large, entirely black species with smoky wings; eyes hairy; face bare; scutellum with long black bristle-like hairs; ocellar and frontal triangles with fairly long black pile; ocellar triangle with central, longitudinal, smooth broad groove; antennae and arista black; third joint small, nearly round in outline; arista long, but little shorter than hind metatarsus. Thoracic pile black, fairly long on mesonotum and long and coarse on pleurae; bristles on mesonotum near wings. Legs entirely black with black pile. Second and third tergites subopaque, broadly shining on anterior corners, elsewhere shining dark bronzy green. Wings blackish at base, becoming less infuscated apically; squamae whitish with yellowish rim; halteres whitish with darkened knobs. Length 11 mm.; wing 9.5 mm.

Type.—Cat. No. 25374, U. S. Nat. Mus., ♂.

Collected at Forest Hills, Massachusetts. Sent to writer by Dr. J. Bequaert.

This species keys out with *nigrovittata*, *oriliaensis* and *borealis* as its closest associates. It is abundantly distinct from each of these and may be distinguished at once by the black pile of thorax and legs.

***Chilosia florella*, new species.**

Male.—Less than medium size, greenish black in color;

clothed with pile entirely luteous in color; eyes hairy; face bare; a few long and very slender hairs, besides the usual pile, on scutellum which are also luteous in color; antennae and arista yellowish brown; third joint small, about twice as large as second; arista fairly short, bare; face moderately concave between the eyes and tubercle; tubercle prominent, not extending as far as base of antennae. Femora black, darkened at their apices; tibiae yellow, broadly darkened in the middle; tarsi brownish. Abdomen but little opaque on second and third tergites. Wings luteous throughout, more deeply so basally; squamae white; halteres reddish brown. Length 7.5 mm.; wing 6.5 mm.

Female.—Of medium size, otherwise similar in general appearance to male. Antennae reddish yellow; third joint about four times as large as the second; arista subequal to width of frons at antennae; face rather deeply excavated; tubercle pronounced and extending beyond antennal base. Legs with color pattern similar to male but more orange in color. Wings rather broad, luteous. Length 8.75 mm.; wing 7.25 mm.

Type.—Cat. No. 25373, U. S. Nat. Mus., male. One female, allotype.

Collected at Moore's Lake, Idaho, July 10, 1907, by J. M. Aldrich.

Chilosia bicolorata, new species.

Female.—Large species; eyes pilose, face bare; thorax with long, dense pale pile; abdomen with short black pile on third, fourth and fifth segments; thorax brassy, abdomen shining black; pile on frons, eyes and facial strips long and pale; face prominent, produced downward, covered with unusually long pubescence but which is by no means as long as pile on facial strips. Antennae reddish yellow, third joint large, its lower edge rounded; arista brown, equal to width of frons at base of antennae. Thoracic pile luteous. Femora black with brownish apices; tibiae brown with broad median black band; tarsi blackish. Sides of first and second and basal corners of third tergite brassy with luteous pile; rest of abdomen black with

black pile. Wings faintly smoky; squamae white; halteres brownish. Length 12 mm.; wing 8.5 mm.

Type.—Cat. No. 25369, U. S. Nat. Mus.

One specimen, Moore's Lake, Idaho, July 10, 1907 (J. M. Aldrich).

Chilosia julietta, new species.

Female.—Fairly large species with rather long dense pile on thorax; eyes pilose, face protruding downward, bare; thorax dark aeneous with brownish pile; abdomen dark aeneous on sides, rather inclined to be broadly opaque black in middle; pile on frons and eyes lutescent to brown; antennae fairly large, reddish brown; third joint quadrate; arista brown, shorter than width of frons. Face shining black, pale pubescent on mouth slopes. Thorax dark aeneous with brownish pile. Femora black with brownish apices; tibiae yellowish basally, darkened on apical half; tarsi darkened. Abdominal pile luteous to brownish. Wings smoky; squamae faintly yellowish, halteres reddish yellow. Length 10.5 mm.; wing 8 mm.

Type.—Cat. No. 25370, U. S. Nat. Mus.

One specimen collected at Julietta, Idaho, May 3, 1901 (J. M. Aldrich).

Chilosia orilliaensis Curran.

Male.—Medium sized species, shining black. Eyes hairy, face bare, blackish pilose with thoracic bristles. Head broadly oval, almost circular in outline; antennae medium, brownish; arista black, slender, longer than frons; face very slightly concave between antennae and the very inconspicuous tubercle. Epistoma but slightly produced. Femora black with brownish apices; tibiae brown with broad medium black bands; tarsi darkened. Second and third tergites broadly opaque. Basal corners of the tergites aeneous with luteous pile, posterior corners black with black pile. Wings smoky; squamae faintly brown, with brown cilia, halteres brown. Length 9.5 mm.; wing 8 mm.

Female.—Pile entirely pale, short on mesonotum, fairly long on pleurae. Antennae reddish yellow, normal in size, third

joint slightly longer than broad; face entirely covered with whitish pubescence; epistoma very slightly produced. Wings smoky; squamae white; halteres reddish yellow. Length 9 mm.; wing 7 mm.

Redescribed from sixteen specimens, eight males, eight females.

A rather common early spring species attracted to the swamp marigold, *Caltha palustris*, in the swamps in the region about Ithaca, New York.

In a batch of material Mr. C. W. Johnson sent the writer there is a series of specimens collected at Halfway House, Mount Washington, June 13, 1916, and July 16, 1915, which are so similar to the New York specimens that they are placed with them. Also in Dr. Aldrich's collection there are two females collected by him at Lake Metigoche, Turtle Mountains, North Dakota, June 20, 1918, which are quite inseparable from *orilliaensis*. Thus this species appears to have a wide northern range. It is rather closely related to *C. baroni*, which may be distinguished from *orilliaensis* by its brown antennae.

Chilosia burkei, new species.

Male (allotype).—Deep blue species, clothed with black pile. Eyes and face hairy. Head broadly oval in outline; antennae reddish brown; arista long, about half again as long as width of frons; face gently concave from antennae to rather prominent tubercle. Thoracic pile rather long, longer and coarser on scutellum, the downward projecting pile on the lower posterior border blackish. Femora black, tibiae and tarsi brown; pile on coxae white with black hairs intermixed. Basal corners of tergites aeneous with light pile, posterior corners black with brown pile. Wings slightly smoky; squamae slightly tinged, cilia darker; halteres reddish yellow. Length 8.75 mm.; wing 7.5 mm.

Female (type).—Frontal, facial and mesonotal pile black; antennae large, reddish yellow; arista brown, pubescent, longer than width of frons; tubercle prominent, exceeding base of antennae; face produced downward. Scutellum with long, slen-

der bristles; pleurae with mostly light pile. Pile on coxae light; legs blackish brown, knees light brown. Abdomen shining dark blue, with light pile. Wings faintly tinted; apical cross-vein tends to be slightly upturned on its distal end; third vein broadly curved downward. Squamae white with yellowish border and cilia; halteres reddish yellow. Length 9 mm.; wing 8 mm.

Type.—Cat. No. 25376, U. S. Nat. Mus.; female, Hoquiam, Washington, May 18, 1903. H. E. Burke collector. Male, allotype, Hoquiam, Washington, reared from *Tsuga heterophylla*. Also one female, Dewalto, Washington, June 7, 1906, and Moscow, Idaho, both taken by Dr. J. M. Aldrich.

This species was determined as *C. alaskensis* by Coquillett and is the name used by Burke in his paper, "Black Check in Western Hemlock," Bureau of Entomology Circular 61, 1905. (See *C. catalina*.)

Chilosia pontiaca, new species.

Female.—Rather small, shining dark blue species; eyes and face hairy. Frontal, facial and mesonotal pile black. Antennae reddish yellow; arista brown, pubescent, longer than width of frons; tubercle prominent, extending beyond antennal base. Scutellum with stiff bristles. Sternopleurae with light pile, pleurae elsewhere with black pile. Legs black, knees brown; pile on coxae black and light. Abdomen shining dark blue, with short black pile; wings faintly tinged; apical corner of first posterior cell acute; squamae faintly yellow; halteres yellow. Length 7 mm.; wing 6.25 mm.

Type.—In C. W. Johnson's collection.

Three specimens, Halfway House, Mount Washington, New Hampshire, July 6, 1914 (C. W. Johnson).

Cartosyrphus kincaidia, new species.

Eyes bare; arista minute pubescent; face bare; scutellum with bristles; female with face, humeri and scutellum black; male with opaque bands.

Male.—Ocellar triangle with black and whitish pile; frontal triangle black with black pile. Antennae reddish yellow, first two joints darkest; third joint longer than broad; arista reddish

brown. Face gently concave; tubercle distinct, epistoma not produced; eye margins with fine, whitish pile, silvery pollinose near antennae. Thorax shining black with rather long dirty yellowish pile, side margin and postalar calli with black hairs and bristles; pleurae with pile somewhat paler than that on mesonotum and with a few black bristles. Scutellum with yellowish pile and with the margin thickly beset with black bristles. Femora shining black, their apices yellowish; tibiae bright yellow with an infusate band about middle; fore tarsi with the first and last joints darkened, the others yellow; middle with only the last joint darkened; hind tarsi with first joint black, the second and last darkened, the others dark yellow. Abdomen shining dark greyish; second and third segments with opaque bands about one-fourth width of a segment on posterior margins; the pile on the dorsum short dirty yellowish and dark, the sides with fairly long, whitish pile, hypopygium with short black pile. Wings with the costa vein brought well around the tips and the third vein in meeting the end of the costa takes a broad, decidedly downwardly curved direction. Wings with a slight brownish tinge; stigma luteous. Squamae and cilia pale yellowish white; halteres dark orange. Length 6–8 mm.; wing 5–7 mm.

Female.—Frons shining black, with very short, pale and blackish pile. Antennae bright orange, upper and outer edge of third joint sometimes darkened; third joint very large, a little longer than broad. Face shining black with the face more prominent than in the male. Thorax with very short, scattered lutescent pile. Scutellum with fewer bristles than the male. Legs marked as in the male. Abdomen entirely shining with very short pale pile. Wings broader than in the male and the third vein with the broad curve. Squamae and cilia whitish, halteres orange. Length 6–7 mm.; wing 5–6 mm.

Type.—Cat. No. 25382, U. S. Nat. Mus., male; female allotype.

Four males and four females; Kukak Bay, Alaska, July 1 and 4, 1899, Saldovia, Alaska, July 21, 1899 (Harriman Expedition, 1899, T. Kincaid, collector).

Coquillett recorded (Proc. Wash. Acad. Sci., vol. 11, p. 428, 1900) this species as *Chilosia pulchripes* of Europe. It is closely related, but the eye margins of *kincaidia* are broader; the scutellum more thickly beset with bristles and the opaque bands on the abdomen but little more than half as wide. The most striking difference is the big curve in the third vein. *Pulchripes* has this vein only gently bowed.

Cartosyrphus slossonæ, new species.

Shining greenish species. Eyes bare; arista short pubescent; scutellum without bristles; abdomen of male partly opaque; tibiae mostly yellow.

Male.—Pile on ocellar and frontal triangles moderately long, dark brownish. Frontal triangle punctate. Antennae yellowish brown, third joint large, longer than broad, arista blackish, microscopically pubescent, about one and one-fourth the length of antenna. Face shining black, broadly silvery pollinose below antennae, concave below, the tubercle protrudes as far forward as antennal prominence; epistoma not protruding; lower margin of face drops but little forward; eye margins narrow, punctate and with short pale pile. Mesonotum with pale pile, lateral margins with rather dense, short, blackish hairs; postalar calli with a few long black hairs; pleurae with mostly pale pile, the rest dark brownish; scutellum with pale pile, no black hairs or bristles. Femora black, yellow on apices, clothed with black and white pile; tibiae yellow, each with an infusate band about middle; first and last tarsal joints darkened, the others yellowish. Second and third abdominal segments opaque on posterior margin, the third rather broadly subshining down the middle, rest of abdomen shining metallic very dark greenish; fourth and fifth segments with some black pile, the pile on rest of abdomen short, pale dirty yellowish, longer along sides. Wings with a yellowish tinge; stigma luteous, last section of fourth vein very long. Squamae yellowish white, the margin and the cilia pale yellowish; halteres pale yellowish. Length 10.5 mm.; wing 9.5 mm.

Female.—Head less subspherical than in the male. Front shining black with short yellow pile. Antennae brownish or

bright yellow, third joint very large, longer than broad; arista blackish. Face more deeply concave than in the male. Thorax with short lutescent or golden pile. Legs as in the male except that the tibiae lack the infusate band on the middle and the first tarsal joints of the fore and middle legs are yellow. Abdomen entirely shining with short, dirty yellowish pile. Wings with a brownish orange tinge, stigma more strongly yellowish. Wings a little shorter and broader and the last section of fourth vein much shorter than the male's. Squamae and halteres like the male's. Length 9.25 mm.; wing 7.5–8 mm.

Type.—Cat. No. 25388, U. S. Nat. Mus., one male, two females. Type and paratype, females, Franconia, New Hampshire (Mrs. Slosson); allotype, male, Littleton, New Hampshire (F. F. Hodgemann).

Chilosia capillata Loew is its closest ally, but the male has pale pile on frontal and ocellar triangles; the third antennal joint noticeably smaller; no black pile or hairs on the thorax; no infusate band on the fore and middle tibiae; all the pile on the abdomen is pale and shorter and the last section of the fourth vein is shorter. The female has the third antennal joint smaller and darker, the yellow on the legs not as bright and the pile everywhere is paler. *C. slossoni*, female, has the third antennal joint nearly equal in size to the third joint of *C. signatiseta*. In *capillata* the width of the face below the antennae is noticeably greater than the length of arista while *slossoni* has the width less than the length of arista.

THREE UNDESCRIBED NEMATOCEROUS FLIES FROM NEW ZEALAND

(Diptera)

By CHARLES P. ALEXANDER

Two of the three species of Diptera described herewith were sent to me by Messrs. Harris and Howes, to whom my sincere thanks are extended. The types are preserved in the writer's collection.

Family RHYPHIDAE

Trichocera obtusicornis, new species.

Male.—Length about 2.5 mm.; wing 3 mm.

Female.—Length 2.5–2.8 mm.; wing 3.4–3.7 mm.

Generally similar to *T. maori* Alexander, differing as follows:

Size smaller. General coloration (in alcoholic specimens) much paler brown, the pleura pale brownish testaceous. Wings pale brown, the stigma lacking. Venation: Sc_2 opposite about one-third to one-fourth the length of Rs ; m faint, much shorter than the petiole of cell M_1 . Male hypopygium with the pleural appendages less elongate. Gonapophyses smooth. Penis-guard terminating in obtuse horns, the apex of each with a very shallow incision.

Habitat.—New Zealand (North Island).

Holotype, ♂, Ohakune, altitude 2,060 feet, July, 1921 (T. R. Harris).

Allotopotype, ♀.

Paratopotypes, 3 ♀'s.

Trichocera lobifera, new species.

Male.—Length 3 mm.; wing 3.3 mm.

Female.—Length 3.3 mm.; wing 3.5 mm.

General coloration of alcoholic material pale brownish yellow. Antennae of the female but little shorter than those of the male. Wings tinged with yellowish grey; stigma faint. Male hypopygium with the pleural appendage elongate, on the mesal face at from one-third to one-fourth the length a conspicuous, glabrous perpendicular lobule; mesal face of appendage distad of this lobule with abundant short setae.

Gonapophyses and penis-guard appearing as slender, chitinized rods. Valves of ovipositor fleshy but rather elongate.

Habitat.—New Zealand (South Island).

Holotype, ♂, Little River, Mount Fitzgerald, altitude 1,500 feet, January 24, 1922 (E. S. Gourlay); R. R.

Allotopotype, ♀.

The types were associated with *Molophilus luteipygus* Alexander and *M. banksianus* Alexander, all three species being preyed upon by a small species of Empididae.

Family DIXIDAE

The only *Dixa* so far described from New Zealand is *D. campbelli* Alexander. This may be the species mentioned, but not described, by Marshall (Trans. N. Z. Inst., vol. 28, p. 222, 1896), or the latter may have pertained to some other still undescribed form.

***Dixa otagensis*, new species.**

Male.—Length 3.6 mm.; wing 4.5 mm.

Rostrum and palpi black. Antennae and head black.

Mesonotum brown, the color almost obscured by the very broad black stripes on the praescutal region; scutellum pale brown; postnotum black. Pleura black, the mesepimeron and the lateral sclerite of the postnotum obscure brownish yellow, brightest ventrad of the wing-root. Halteres brown, the extreme base yellow, the knobs darker. Legs with the coxae brown, the posterior coxae more yellowish; trochanters yellow; remainder of the legs black. Wings with a faint brownish tinge, more pronounced in the costal region; a brown cloud at the *r-m* cross-vein; veins dark brown. Venation: Sc_1 ending immediately before the origin of *Rs*; *r-m* connecting with *Rs* a little less than its own length before the fork; *m-cu* a little more than its own length beyond *r-m*; cell M_2 deeper than in *D. campbelli*.

Abdomen dark brownish black.

Habitat.—New Zealand (South Island).

Holotype, ♂, Ben Lomond, Otago, December 30, 1921 (G. Howes).

Paratopotype, Sex?.

NEW CHALCID-FLIES FROM EASTERN
AUSTRALIA

III

(Hymenoptera)

BY A. A. GIRAULT

***Stomatoceras colliscutellum*, new species.**

Small; black, tibial tips widely, tarsi yellowish, wings clear; hind margin fore wing embrowned from about opposite middle of submarginal to opposite apex stigmal, a midlongitudinal shaft from curve of submarginal to half-way to apex from apex venation where it terminates in a wavy cross-arm. Densely punctate; scutum with a "hillock" centrally, scutellum a conical "hill," the strong terminal teeth projecting from its base. Funicle 1 somewhat wider than long, 2 twice longer than wide, much exceeding pedicel, longest.

From two females, reared from lady-birds, Brisbane, Queensland, November, 1915 (H. Jarvis); through Henry Tryon, Department of Agriculture and Stock, Queensland.

***Tumidicoxella plutellophaga*, new species.**

As *australiensis* but funicle 1 somewhat shorter than club, proximal and distal fourths tibia 3 above, knees, tips of other tibiae and tarsi, yellow. Male very similar.

A pair, reared from *Plutella maculata*, October 10, 1908, from same source as preceding.

***Aligherinia*, new genus (Cleonymidae).**

Shaped like an *Eupelmus* but ovipositor not extruded, abdomen with a short, stout petiole; like *Eupelmus* but antennae at end of head, widely separated, 11-jointed, one ring-joint, club solid; jaw 2 widely truncate; frons moderate. Prothorax transverse-quadrate, the pleurum deeply impressed, with a narrow, curved sulcus through it. Parapsidal furrows delicate, curving off to pleurum, parapsides short. Scutellum convex, a median carina at base, apex round. Propodeum with a median carina. Segments of abdomen equal, entire, the wings as

Eupelmus; postmarginal not much exceeding stigmal. Femur 3 simple.

Aligherinia sidneyi, new species.

Large; aeneus, wings brown from base of marginal to apex submarginal. Legs except coxae, tibia 2 and femora and tibiae 3, red, basal tarsal joints white. Scape red. Parapsides, propodeum, abdomen glabrous, head and thorax densely shagreened. Funicle 1 smallest, quadrate, 6 largest, a bit longer than wide.

Sydney, forest, October 28, 1917.

Systolomorphella richteri, new species.

Aeneus, antennae, legs red save coxa 3, femora and tibiae 3 above somewhat and 1 of tarsus 3. Fore wing with wide cross-stripe from apex stigmal to nearly proximal fourth marginal; also a moderately narrow one from middle of submarginal. Funicles wider than long, 1-4 quadrate. Femur 3 with four minute teeth between middle and apex. Postmarginal a third longer than stigmal. Pedicel equal funicle 2. Abdomens 2 and 6 largest. Jaw 2 very wide, concaved. Like other species.

Pentland, Queensland, forest, November, 1917.

Xanthoencyrtus extraclavus, new species.

Club enormous, about twice funicle, latter's joints subannular. Brownish black, legs yellowish, club jet. Like other species otherwise.

Brisbane, Queensland, forest (H. Hacker).

Systolomorphella pentlandi, new species.

Aeneus, legs save coxa 3, antennae save distal two joints, red. Wings with an obscure, widening cross-stripe from apex stigmal. As *unifasciatipennis* but antennae with a distinct ring-joint as in *dinotipennis*. Tarsi white. Spiracular sulcus foveate, foveae along each side of median carina. Scape compressed-clavate, pedicel three-and-a-half times the ring-joint, funicles as long as pedicel and wider. Abdomen 6 largest. Femur 3 as in genotype. Axillae much larger than in *richteri* and the post-

marginal and stigmal much longer. Spur of club abrupt (not as in *dinotipennis* where the club is simply acuminate).

Forest, Pentland, Queensland, January, 1918.

Echthrogonatopus aereifemur, new species.

As gentotype but abdomen longer, subacuminate; scape, pedicel shorter; marginal a half shorter, only twice stigmal; club rather less stout and a bit shorter; coxae, femora except ends and tibia 2 near base, green; antennae white, apex club, pedicel above, dusky; funicles 1-4 equal, a bit wider than long, 6 largest, quadrate, over thrice 1, shorter than pedicel. Jaw teeth more obtuse, equal. Setae from submarginal, also cilia proximad of hairless line, fine.

Nelson, Queensland.

Angeliconana, new genus.

As *Copidosomyia* but club as in *Copidosoma*. Marginal largest, quadrate, its distal edge obliquely truncate, postmarginal absent, stigmal curved, somewhat longer than the marginal. Abdomen as in *Copidosoma* but ovipositor only slightly extruded. Frons wide.

Angeliconana eja, new species.

As species of *Copidosoma*. Green, wings clear, veins dark, knees, tibial tips, tarsi reddish yellow. Pedicel somewhat longer than wide, exceeding any funicle, of which 1 is shortest, nearly twice wider than long, 2 and following subquadrate. Club three-fourths funicle. Jaw 2 a bit longest, all acute. Densely scaly, scutellum glabrous at apex, rest finely longitudinally lined. Lateral ocellus twice closer to eye than to cephalic ocellus.

Two females, Nelson.

Pseudectroma bryanti, new species.

As gentotype but ovipositor barely extruded, inserted proximal third, jaw teeth much more minute, scape not compressed, body less robust, stripe 4 on abdomen absent, abdominal spiracle at base distal third. Types compared.

Nelson, January.

Ænasomyiella cervicincta, new species.

As genotype but postmarginal as long as stigmal, proximal half and all ventral margin scape, purple; neck of pronotum widely and hind margin of pronotum narrowly purple, scape not so wide. Types compared.

Nelson.

Westwoodiana, new genus (Cleonymidae).

From *Epistenia (miripes)*, abdomen not carinated nor stylate, femur 3 only thickened, flagellum filiform, marginal distinctly shorter than the elongate postmarginal which extends to apex, abdomen '2 longest. Head locustiform, antennae 11-jointed, one ring-, one club-joint.

Westwoodiana testaceifemora, new species.

Aeneus, legs except coxae, basal third tibia 2, base widely tibia 3 and antennae except club at distal half, testaceous; wings with a triangular cloud, its apex at stigmal knob and which gives off from its caudo-proximal angle, in middle of wing, two subparallel, longitudinal branches which run to opposite base of marginal. Tarsi yellowish. Ovipositor one-fourth abdomen, testaceous. Eyes densely hispid. Pedicel six times longer than wide, somewhat shorter than funicle 1, both very elongate. Finely punctate; meson ventrum bearded; propodeum rugulose, short at meson. Pronotum with a median carina, bearded each side of it.

Brisbane, Queensland, April 20, 1917 (Hacker).

Meselatus, new genus (Perilampidae).

As *Perilampus* but non-metallic and like *Eurytoma*; marginal about five times longer than wide, not quite twice the short, curved stigmal, postmarginal acute, very short. Axillae barely separated; antennae filiform, a bit below middle of face. Two stout hind tibial spurs. Ring-joint cup-shaped, divisions of club indistinct. Male antennae two less funicles.

Meselatus ficus, new species.

Reddish yellow, wings lightly embrowned from base to end of venation, with a small, hemispherical jet spot against apex

submarginal; veins dark. Following jet parts: Occiput centrally more or less, bases of all coxae and femora; neck prothorax, metathorax, cephalic and lateral margin of parapside except lateral margin at distal third; cephalic two-thirds scutum save lateral margin, an oval spot center scutellum; thoracic pleura and vertex, lateral half axilla, ovipositor valves and apices of abdominal segments dorsad, more widely mesad, wider still on distal segments where the black is suffused. Funicles twice wider than long, shorter than pedicel. Tibiae 3 clavate, above with strong, stout teeth far apart. Male funicle 1 quadrate; coxae and femora save latter at apex, abdomen, thorax save distal margin pronotum, distal and lateral margins parapsides, distal margin scutum and lateral margins widely of scutellum, black; propleura yellow save middle. Head suffused with dusky, occiput, ocellar area black.

From three males, five females on slides, Brisbane, March, 1919, "in fruit of *Ficus*," Department of Agriculture and Stock, Queensland (H. Tryon).

Schizonotus punctatiscutum, new species.

Brilliant purple, wings clear, scape reddish; tibiae and tarsi lemon. Head and thorax punctate save axilliae and apex scutellum (distad of cross-suture) which are shagreened; propodeum non-carinate, spiracle small, cephalic; abdomen 2 not lengthened. Pronotum short, scutum pilose. Marginal a bit exceeding postmarginal, the long stigmal a bit shorter still, knob distinct. Clypeus simple, jaws 4-dentate. Funicles 2 and 3 quadrate, 5 twice wider than long. Legs simple. Abdomen smaller than thorax.

Wynnum, Queensland, forest, May 1, 1921.

Schizonotus punctatifascies, new species.

As preceding but scape concolorous, tibiae, tarsi reddish brown, scutellum impunctate, parapsides so cephalad only save along mesal margin, propodeum with narrow median carina. Funicle 1 subquadrate, rest equal, shorter. At least one jaw 4-dentate.

Wynnum, forest, in May.

Schizonotus arboris, new species.

As immediate preceding but tibiae concolorous, jaws 3-dentate, marginal, postmarginal and stigmal shorter, neck of latter not so thin.

Wynnum, forest, in May.

Eunotomyia, new genus (Eunotinae).

Abdomen sessile, with a small, dense, white tuft on each side of base; postmarginal fainter, two-thirds stigmal, latter about half of marginal; tibial spur not enlarged, susal; jaw-teeth 3, subequal; antennae 8-jointed, no ring-, club solid. Head not much wider than long. Abdomen 2 three-fourths surface; axillae widely separated, scutellum simple, normal; propodeal neck large. Pronotum as in *Eurytoma*.

Eunotomyia corvus, new species.

Shining black, wings faintly dusky; scutum, scutellum coarsely scaly, naked, abdomen 2 glabrous, vertex scaly, neck of propodeum finely shagreened, rest of region across meson with about four longitudinal carinae limited by a cross-carina at apex (base of neck). Funicles 2 and 5 abruptly larger than the others which are equal and twice wider than long, pedicel longer, somewhat longer than wide. Club much enlarged, exceeding funicle, all funicles wider than long.

Toowong, Brisbane, forest, November 2, 1917 .

Toxeumoides magnimaxillae, new species.

As genotype but tooth 1 of jaw third longer and distinctly narrower than 2, legs save coxae, reddish brown, head finely lined, abdomens 4-6 visible, propleurum pin-punctate, tegulae red, spiracular sulcus non-foveate, a fovea cephalic margin propodeum between meson and spiracle.

Three females, Brisbane, on flowers (H. Hacker).

Australeunotus, new genus (Eunotinae).

As *Muscideopsis* but scutellum simple, stigmal two-thirds marginal, a bit exceeding postmarginal, abdomen 2 two-thirds surface, abdomen depressed, conic-ovate, exceeding thorax;

pronotum short; propodeum with a neck, median, lateral and a cross-carina and a deep valley straight from the minute spiracle. Jaws narrow, three subacute, successively shorter teeth. Maxillary palpi 2-jointed, 2 larger.

Australeunotus ruskini, new species.

Black, opaque, legs except coxae more or less, antennae brown yellow, wings with a rather faint, ovate cloud in disk appended, like a pear, from about apex marginal. Finely reticulated, abdomen 2 smooth. Funicle 5 much widest, largest, 1 narrowest, a bit wider than long, 2 twice wider than long, 3-4 larger yet not half of 5; club not quite equal funicle as to length. Lateral ocelli a third cephalic, a bit nearer to eye than to cephalic. Parapsidal furrows deepening and widening near apex.

Wynnum, forest, July 13, 1921.

Systolomorphella dinotipennis, new species.

As genotype but antennae a bit below eyes, with a ring-joint, hind femora only a bit swollen, distad with several minute thorn-like teeth; abdomen ovate, convex, larger than thorax, with a quadrate petiole, 6 longest; cephalic margin propodeum also furcate, spiracle small, rounded, its sulcus narrow. Legs red save hind coxae, tibiae and 1 of hind tarsus, the other tarsi more or less metallic and the femora so above. Club red; funicle 2 a bit longer than wide, shorter than pedicel by a bit, equal following. Club hardly conical at apex. Apex abdomen not markedly hairy. Fore wing with narrow cross-stripe at bend of submarginal and a wide one from marginal and stigmal, but from proximad a long, narrow clear wedge between the stripe and marginal. Petiole longitudinally striate. Jaw 2 widely truncate. Parapsidal furrows almost complete, hidden distad by pubescence.

Pentland, Queensland, forest, November.

NEW AUSTRALIAN EUSANDALUM

(Hymenoptera, Encyrtidae)

BY A. A. GIRAULT

The following new species were collected from the trunks of trees, and the descriptions are based upon careful comparisons, only the differentials therefore given. In my experience, in any piece of forest, only certain trees are visited by these Chalcids, dead ones and at the same time infested with beetles whose larvae bore in the wood. On such trees, the flies may be seen as isolated examples, crawling over the surface, facing anyone or anything that approaches and prepared to launch into the air if alarmed. As they perhaps spend all or most of their adult life upon these host trees or near them, this accounts for the small number of species so far known and for the few I have been able so far to collect (by sweeping mostly).

I ought to say that a new country should make every effort to explore its fauna before settlement and commerce destroy or change it, and in regard to this portion of Australia's original population, I consider that Mr. A. P. Dodd, by his special efforts, has succeeded in saving for science many forms which in the course of not many more years would most likely have become extinct and therefore wholly lost. This is not the first time I have received from him specimens never met with by myself and likely, but for his efforts, to have been lost forever.

Eusandalum arboris, new species.

As *cyaniventris* Girault but ciliation of fore wing distinct, rather coarse; costal cell with several lines of cilia, at least distad, setae of marginal vein minute, numerous; fringes present; legs reddish save coxae and femur 1 at distal third laterad; stigmal neck long. Coppery; robust.

Wynnum, southern Queensland, two females, November.

Eusandalum brevistylus, new species.

As *arboris* but ovipositor still shorter, body half smaller, legs red save coxae, frons with a slight median impression; stylus

at base with several long hairs (from lateral aspect of apex of segment preceding stylus, absent in other). Wings clear.

Four females, Kuranda, Queensland (A. P. Dodd).

Eusandalum longistylus, new species.

As *stylatus* Girault but wings clear, body a third less robust, legs 1 and 3 mostly metallic; costal cell with but a single line of discal cilia.

Three females, Kuranda (A. P. Dodd).

Eusandalum compressistylus, new species.

Ovipositor half of abdomen, the compressed, punctulate stylus nearly as long as it; as *stylatus* Girault otherwise but neck of stigmal distinctly more slender, costal cell with three lines of coarse cilia at over distal third, then several fine lines proximad along cephalic margin; legs save coxae, yellowish brown. Fore wing brown from base to middle of submarginal, from thence with wide midlongitudinal fuscous stripe to apex; facial sculpture coarser, teeth of facial carina coarse, segment before stylus finely cross-lineolated, the stylus thick, rounded above, no median carina. Postmarginal four times the stigmal.

Two females, Kuranda, December, 1920 (A. P. Dodd).

Eusandalum impressifrons, new species

As *compressistylus* but less robust, distal abdomen and stylus not coppery, stylus with median carina; legs concolorous save most of tibia 2 beneath, tibia 3 widely at apex beneath; stigmal round, subsessile. Fore wing clear to bend of submarginal, thence fuscous save margins. Frons with a rather deep but sculptured median channel, bounded by lateral ocelli (present in *compressistylus*).

One female, Nelson, Queensland (A. P. Dodd).

Eusandalum brevistylus Girault, variety **aereifemora**, new.

As typical form but femora 1 and 3 concolorous, also tibiae 1 and 3 save beneath and at apex. Stylus distinctly wider than long at base.

One female, Ayr, Queensland, June (A. P. Dodd).

THE AMERICAN AEDES OF THE SERRATUS GROUP

(*Diptera, Culicidae*)

By HARRISON G. DYAR

This is the last of the larger groups into which I divided *Aedes*, subgenus *Ochlerotatus* (Ins. Ins. Mens., viii, 104, 1920). The others have been recently gone over in the pages of this magazine. In regard to the nomenclature originally adopted, two changes in the subgeneric names seem indicated, namely *Ochlerotatus* for *Heteronychia* (see Ins. Ins. Mens., ix, 150, 1921) and *Culicelsa* for *Taeniorhynchus*. The latter change rests upon the question as to whether an author's type is to be considered the species he states it to be, or the species actually before him. I adopted the former view, but the consensus of opinion seems to be in favor of the latter. No authoritative ruling could be obtained on the subject. Lynch described the genus *Taeniorhynchus*, founding it on a species which he called *taeniorhynchus* of Wiedemann, but which was really Walker's *titillans*. If *taeniorhynchus* Wied. be considered the type of *Taeniorhynchus* Lynch, as stated by Lynch, then *Taeniorhynchus* becomes a subgenus of *Aedes* as used by me; but if *titillans* Walker be considered the type of *Taeniorhynchus* Lynch, which was the species before Lynch at the time, then *Taeniorhynchus* replaces *Mansonia* Blanchard, a distinct genus. This latter view is adopted by Theobald, Edwards and others, and to avoid confusing diversities in nomenclature, it may be best to follow suit in the present instance.

The species of *Ochlerotatus* of the *serratus* group may be separated by the characters of the male hypopygium as below. Two species which I suppose to belong to the group are unknown in the male. These are *mathisi* Neveu-Lemaire and *knabi* Coquillett, listed in their probable position.

TABLE OF SPECIES

Basal lobe of side piece rounded and bulbous.

Filament of claspette broadly blade-shaped.....*fulvus* Wiedemann

Filament of claspette not so formed.

Filament of claspette with retrose point.....*hastatus* Dyar

Filament of claspette elliptical, projecting at the base and lined,
"calla-lily shaped."

Stem of claspette stout, with a branch,

hortator Dyar & Knab

Stem of claspette long and slender.....*nubilus* Theobald

Filament of claspette slender.

Stem of claspette short, the filament longer than it,

.....*dupreei* Coquillett

Stem of claspette longer than the filament.

Stem much longer than filament; apical lobe large

and prominent.....*serratus* Theobald

Stem not much longer than filament; apical lobe

small and delicate.....*eucephalaus* Dyar

Basal lobe of side piece elongated, finger-shaped.

Basal lobe enlarged at base, the tip slender.

Stem of claspette thick, sinuous.....*atlanticus* Dyar & Knab

Stem of claspette slender, less sinuous...*tormentor* Dyar & Knab

Basal lobe slenderly finger-shaped throughout.....*oligopistus* Dyar

Aëdes (Ochlerotatus) fulvus Wiedemann.

Culex fulvus Wiedemann, Ausser. Zweifl. Ins., i, 546, 1828.

Culex ochripes Macquart, Dipt. exot., Suppl. 4, part 1, 315, 1850.

Culex flavicosta Walker, Ins. Saund., 431, 1856.

Culex flavicosta Giles, Handb. Gn. or Mosq., 194, 265, 1900.

Culex fulvus Giles, Handb. Gn. or Mosq., 190, 210, 1900.

Culex ochripes, Giles, Handb. Gn. or Mosq., 201, 334, 1900.

Taeniorhynchus fulvus Theobald, Mon. Culic., ii, 208, 1901.

Taeniorhynchus fulvus Giles, Handb. Gn. or Mosq., 2 ed., 470, 1902.

Culex ochripes Giles, Handb. Gn. or Mosq., 2 ed., 470, 1902.

Culex fulvus Giles, Handb. Gn. or Mosq., 2 ed., 394, 1902.

Culex bimaculatus Coquillett, Proc. U. S. Nat. Mus., xxv, 84, 1902.

Taeniorhynchus fulvus Theobald, Mon. Culic., iii, 237, 1903.

Culex bimaculatus Dyar, Journ. N. Y. Ent. Soc., xi, 27, 1903.

Culex bimaculatus Dyar, Proc. Ent. Soc. Wash., v, 147, pl. 2, fig.
14, 1903.

Taeniorhynchus fulvus Giles, Journ. Trop. Med., vii, 383, 1904.

Taeniorhynchus fulvus Lutz, in Bourroul, Mosq. do Brasil, 70,
1904.

Taeniorhynchus fulvus Goeldi, Os Mosq. no Pará, 112, 1905.

Chrysoconops fulvus Goeldi, Os Mosq. no Pará, 114, 1905.

Culex ochripes Blanchard, Les Moust., 275, 1905.

Taeniorhynchus fulvus Blanchard, Les Moust., 387, 1905.

- Aëdes bimaculatus* Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 191, 1906.
- Psorophora fulva* Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. ser. 11, 14, 1906.
- Ochlerotatus bimaculatus* Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. ser. 11, 18, 1906.
- Ochlerotatus bimaculatus* Dyar, U. S. Dept. Agr., Bur. Ent., Circ. 72, 4, 1906.
- Chrysoconops fulvus* Theobald, Mon. Culic., iv, 493, 1907.
- Chrysoconops fulvus* Peryassú, Os Culic. do Brazil, 49, 230, 1908.
- Aëdes fulvus* Knab, Ent. News, xx, 387, 1909.
- Chrysoconops fulvus* Theobald, Mon. Culic., v, 443, 1910.
- Aëdes bimaculatus* Thibault, Proc. Ent. Soc. Wash., xii, 22, 1910.
- Aëdes bimaculatus* Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 622, 1917.
- Aëdes fulvus* Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 624, 1917.
- Aëdes (Ochlerotatus) bimaculatus* Dyar, Ins. Ins. Mens., vi, 78, 1918.
- Aëdes bimaculatus* Barret, Ins. Ins. Mens., vii, 63, 1919.
- Aëdes bimaculatus* Sherman, Journ. E. Mitchell Sci. Soc., xxxvi, 91, 1920.
- Aëdes (Heteronycha) fulvus* Dyar, Ins. Ins. Mens., viii, 105, 1920.
- Aëdes (Heteronycha) bimaculatus* Dyar, Ins. Ins. Mens., viii, 105, 1920.
- Aëdes fulvus* Dyar, Ins. Ins. Mens., viii, 174, 1920.

In the monograph we recognize *fulvus* and *bimaculatus* as distinct species; but it seems to me that the difference is not more than racial. In the North American form the black markings on the mesothorax are reduced, while the ciliation on the hind legs is less pronounced; but a gradation seems indicated. No Mexican material is in the collection, and I suspect that the apparent hiatus between our Gulf coast form and the form that appears in Central America and southward is due to the absence of collections in the intervening territory.

Aëdes (Ochlerotatus) mathisi Neveu-Lemaire.

- Culex mathisi* Neveu-Lemaire, Arch. de Parasit., vi, 13, 1902.
- Culex mathisi* Blanchard, Les Moust., 370, 1905.
- Culex mathisi* Theobald, Mon. Culic., iii, 220, 1903.
- Culex mathisi* Theobald, Mon. Culic., v, 362, 1910.

Culex mathisi Surcouf & Gonzales-Rincones, Essai Dipt. Vul. Venez., 176, 1911.

Aedes (Heteronycha) mathisi Dyar, Ins. Ins. Mens., viii, 105, 1920.

Described from French Guiana from a female, the male being unknown. According to the description, the mesonotum is yellow, marked with brown lines, and with an area of curved scales in the middle.

Aedes (Ochlerotatus) knabi Coquillett.

Culex knabi Coquillett, Proc. Ent. Soc. Wash., vii, 183, 1906.

Aedes knabi Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 203, 1906.

Aedes knabi Dyar, Proc. Ent. Soc. Wash., viii, 16, 1906.

Ochlerotatus knabi Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 18, 1906.

Culex knabi Theobald, Mon. Culic., v, 612, 1910.

Aedes knabi Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 841, 1917.

Aedes (?Gualteria) knabi Dyar, Ins. Ins. Mens., vi, 73, 1918.

No male is yet known. The species resembles *mathisi* and *hortator*, and will presumably be found to belong in this group.

Aedes (Ochlerotatus) hortator Dyar & Knab.

Aedes hortator Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 12, 1907.

Aedes hortator Theobald, Mon. Culic., v, 485, 1910.

Aedes hortator Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 843, 1917.

Aedes (?Gualteria) hortator Dyar, Ins. Ins. Mens., vi, 73, 1918.

Aedes (Heteronycha) hortator Dyar, Ins. Ins. Mens., viii, 105, 1920.

Described from Trinidad from two females. Dr. and Mrs. Bonne have bred the species in Surinam and kindly presented two males to the National Museum.

Aedes (Ochlerotatus) hastatus, new species.

Male. Head and mesonotum entirely covered with silvery scales. Abdomen black dorsally, with large triangular lateral segmental white spots. Legs dark, as the wing-scales.

Hypopygium. Side piece about three times as long as wide; apical lobe long and slender, bare, except for a single coarse seta at tip; basal lobe bulbous, moderate, with many setae on the outer aspect, the spine moderate, adjacent to the basal edge

of the setal group. Claspette stem slender, the filament considerably longer than the stem and with a sharp retrose point at about the middle. Tenth sternites small, with about four rather long spines.

Type, male, No. 25212, U. S. Nat. Mus.; Paitilla, Canal Zone, Panama, December 17, 1921 (J. B. Shropshire).

A single male was bred from a ground-pool, which contained also *Culex coronator*, *Uranotaenia geometrica*, *Psorophora posticus*, *Anopheles apicimacula* and a single female *Aedes*, which may be the female of the present form, but which I preferred to identify as *Aedes serratus*.

Aedes (*Ochlerotatus*) *nubilus* Theobald.

Culex nubilus Theobald, Mon. Culic., iii, 208, 1903.

Culex serratus Coffin (not Theobald), in Shattuck, Bahama Ids., 286, 1905.

Culex nubilus Blanchard, Les Moust., 629, 1905.

Ochlerotatus nubilus Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 19, 1906.

Aedes pertinax Grabham, Can. Ent., xxxviii, 316, 1906.

Aedes pertinax Dyar & Knab, Proc. Biol. Soc. Wash., xix, 163, 1906.

Protoculex quasiserratus Theobald, Mon. Culic., iv, 463, 465, 1907.

Aedes pertinax Pazos, Anal. Acad. Cien. méd. fis. y nat. de la Habana, xlv, 424, 1908.

Aedes pertinax Pazos, San. y Ben., ii, 47, 318, 1909.

Culex nubilus Theobald, Mon. Culic., v, 361, 1910.

Protoculex quasiserratus Theobald, Mon. Culic., v, 401, 1910.

Aedes pertinax Theobald, Mon. Culic., v, 597, 1910.

Culex nubilus Surcouf & Gonzales-Rincones, Essai. Dipt. Vul. Venez., 180, 1911.

Protoculex quasiserratus Surcouf & Gonzales-Rincones, Essai. Dipt. Vul. Venez., 190, 1911.

Aedes nubilus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 721, 1917.

Aedes pertinax Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv., 791, 1917.

Aedes (?*Ochlerotatus*) *nubilus* Dyar, Ins. Ins. Mens., vi, 75, 1918.

Aedes (*Ochlerotatus*) *pertinax* Dyar, Ins. Ins. Mens., vi., 77, 1918.

Aedes polyagrus Dyar, Ins. Ins. Mens., vi, 77, note, 1918.

Aedes (*Ochlerotatus*) *nubilus* Dyar, Ins. Ins. Mens., vi, 128, 1918.

Aedes (*Heteronychia*) *nubilus* Dyar, Ins. Ins. Mens., viii, 105, 1920.

Aedes (Heteronycha) pertinax Dyar, Ins. Ins. Mens., viii, 105, 1920.

In the female, the silver line on the mesonotum may be present or absent. Theobald described *nubilus* from a female in which the silvery mark was absent. The differences given by me in the shape of the claspette filament between *pertinax* and *polyagrus* I do not now consider valid. The shape of this structure seems to vary greatly according to the accidents of preparation. In the form from the Greater Antilles, *Aedes nubilus pertinax* Grabham, the larva has the tuft of the air-tube just within the pecten instead of beyond it.

***Aedes (Ochlerotatus) dupreei* Coquillett.**

Culex dupreei Coquillett, Can. Ent., xxxvi, 10, 1904.

Culex dupreei Smith, Ent. News, xv, 49, 1904.

Culex dupreei Felt, Bull. 79, N. Y. Sta. Mus., 334, 1904.

Culicada dupreei Felt, Bull. 79, N. Y. Sta. Mus., 391c, 1904.

Culex dupreei Smith, Bull. 171, N. J. Agr. Exp. Sta., 38, 1904.

Culex dupreei Smith, N. J. Agr. Exp. Sta., Rept. Mosq., 281, 1905.

Grabhamia dupreei Dyar, Proc. Ent. Soc. Wash., vii, 48, 1905.

Culicada dupreei Felt, Bull. 97, N. Y. Sta. Mus., 447, 479, 1905.

Aedes dupreei Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 195, 1906.

Ochlerotatus dupreei Coquillett, U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 18, 1906.

Ochlerotatus dupreei Dyar, U. S. Dept. Agr., Bur. Ent., Circ. 72, 4, 1906.

Culex dupreei Howard, Osler's Modern Med., 376, 1907.

Protoculex ? dupreei Theobald, Mon. Culic., iv, 466, 1907.

Aedes dupreei Thibault, Proc. Ent. Soc. Wash., xii, 18, 1910.

Protoculex (?) dupreei Theobald, Mon. Culic., v, 402, 1910.

Aedes dupreei Morse, Ann. Rept. N. J. Sta. Mus., 1909, 719, 1910.

Aedes dupreei Headlee, Bull. 276, N. J. Agr. Exp. Sta., 99, 1915.

Aedes dupreei Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 779, 1917.

Aedes (Ochlerotatus) dupreei Dyar, Ins. Ins. Mens., vi, 77, 1918.

Aedes (Heteronycha) dupreei Dyar, Ins. Ins. Mens., viii, 105, 1920.

Several of the records in the monograph for this species must be canceled. Washington, D. C., June 15, 1903 (W. V. Warner) refers to *Aedes triseriatus* Say; Las Loras, Costa Rica, Sept. 9, 1905 (F. Knab), depends upon an unbred larva, which apparently agrees with *dupreei*, but may be another species; Trinidad,

W. I., June, 1905 (A. Busck), is *Aedes oligopistus* Dyar. The only authentic records remaining are New Jersey, Louisiana and Arkansas, to which I have no additions to make.

***Aedes* (*Ochlerotatus*) *serratus* Theobald.**

Culex serratus Theobald, Mon. Culic., ii, 45, 1901.

Culex serratus Giles, Handb. Gn. or Mosq., 2 ed., 457, 1902.

Culex nigripes Parker, Boyer & Pothier (not Zetterstedt), Bull. 13, Yell. Fev. Inst., 37, 1903.

Culex serratus Bourroul, Mosq. do Brasil, 72, 1904.

Culex serratus Blanchard, Les Moust., 360, 1905.

Culex serratus Goeldi, Os Mosq. no Pará, 95, 1905.

Aedes meridionalis Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 189, 1906.

Ochlerotatus serratus Coquillett (in part), U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 19, 1906.

Aedes serratus Dyar & Knab, Proc. Biol. Soc. Wash., xix, 162, 1906.

Protoculex serratus Theobald (in part), Mon. Culic., iv, 464, 1907.

Culex serratus Aiken, Brit. Guiana Med. Ann., 1906, 68, 1907.

Aedes serratus Busck, Smith, Misc. Colls., quart. iss., lii, 64, 1908.

Protoculex serratus Peryassú, Os Culic. do Brazil, 48, 215, 1908.

Protoculex serratus Theobald (in part), Mon. Culic., v, 401, 1910.

Protoculex serratus Surcouf & Gonzales-Rincones, Essai Dipt. Vul. Venez., 189, 1911.

Aedes serratus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 794, 1917.

Aedes (*Ochlerotatus*) *serratus* Dyar, Ins. Ins. Mens., vi, 77, 1918.

Aedes (*Heteronycha*) *serratus* Dyar, Ins. Ins. Mens., viii, 105, 1920.

Except for the genitalia, this species is very difficult to separate from *Aedes nubilus* Theob. The silvery mesonotal stripe appears to be always present in the female, and is generally broader than in *nubilus*. It is probable that the two are often confused.

***Aedes* (*Ochlerotatus*) *eucephalaeus* Dyar.**

Aedes (*Ochlerotatus*) *eucephalaeus* Dyar, Ins. Ins. Mens., vi, 127, 1918.

Aedes (*Heteronycha*) *eucephalaeus* Dyar, Ins. Ins. Mens., viii, 105, 1920.

In the female the mesonotum is marked with a silver line as in the allied species; but the male has the whole mesonotum

silvered over. The types were collected in Surinam, and no other localities are before me.

***Aedes (Ochlerotatus) atlanticus* Dyar & Knab.**

- Culex serratus* Smith (not Theobald), Ent. News, xiv, 309, 1903.
Culex serratus Smith (not Theobald), Bull. 171, N. J. Agr. Exp. Sta., 38, 1904.
Culex serratus Felt (not Theobald), Bull. 79, N. Y. Sta. Mus., 334, 1904.
Protoculex serratus Felt (not Theobald), Bull. 79, N. Y. Sta. Mus., 391d, 1904.
Protoculex serratus Dyar (not Theobald), Proc. Ent. Soc. Wash., vii, 48, 1905.
Culex serratus Smith (not Theobald), N. J. Agr. Exp. Sta., Rept. Mosq., 277, 1905.
Protoculex serratus Felt (not Theobald), Bull. 97, N. Y. Sta. Mus., 449, 490, 1905.
Culex confirmatus Ludlow (not Lynch), Can. Ent., xxxvii, 388, 1905.
Aedes atlanticus Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 190, 1906.
Ochlerotatus serratus Coquillett (not Theobald), U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 19, 1906.
Aedes atlanticus Dyar, U. S. Dept. Agr., Bur. Ent., Circ. 72, 4, 1906.
Protoculex serratus Theobald (not Theobald), Mon. Culic., iv, 464, 1907.
Aedes serratus Morse (not Theobald), Ann. Rept. N. J. Sta. Mus., 1909, 719, 1910.
Leucomyia scapularis Theobald (in part), Mon. Culic., v, 315, 1910.
Aedes serratus Headlee (not Theobald), Bull. 276, N. J. Agr. Exp. Sta., 97, 1915.
Aedes atlanticus Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 799, 1917.
Aedes (Ochlerotatus) atlanticus Dyar, Ins. Ins. Mens., vi, 76, 1918.
Aedes atlanticus Sherman, Journ. E. Mitchell Sci. Soc., xxxvi, 90, 1920.
Aedes (Heteronychia) atlanticus Dyar, Ins. Ins. Mens., viii, 105, 1920.

This species was for long confused with *serratus* Theobald, which is not surprising, as the markings are identical, and the slight difference in the color of the legs would scarcely attract

attention. Only when the larvae or male genitalia are studied does the specific difference become readily apparent.

***Aedes* (*Ochlerotatus*) *tormentor* Dyar & Knab.**

Aedes tormentor Dyar & Knab, Journ. N. Y. Ent. Soc., xiv, 189, 1906.

Ochlerotatus serratus Coquillett (not Theobald), U. S. Dept. Agr., Bur. Ent., Tech. Ser. 11, 19, 1906.

Aedes tormentor Dyar, U. S. Dept. Agr., Bur. Ent., Circ. 72, 4, 1906.

Aedes tormentor Thibault, Proc. Ent. Soc. Wash., xii, 18, 1910.

Aedes tormentor Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 797, 1917.

Aedes tormentor Dyar, Ins. Ins. Mens., vi, 77, note, 1918.

Aedes (*Ochlerotatus*) *tormentor* Dyar, Ins. Ins. Mens., vi, 77, 1918.

Aedes (*Heteronycha*) *tormentor* Dyar, Ins. Ins. Mens., viii, 105, 1920.

This species has no colorational differences from *serratus*; but the larva differs in having a long pecten on the air-tube, which much exceeds the hair-tuft. In both *serratus* and *atlanticus* the pecten does not reach the hair-tuft. The male genitalic differences are well marked. Mr. Franklin Sherman records this species from North Carolina (Journ. E. Mitchell Sci. Soc., xxxvi, 91, No. 10, 1920); but I think that the identification is erroneous and that all the specimens are *atlanticus* D. & K.

***Aedes* (*Ochlerotatus*) *oligopistus* Dyar.**

Aedes dupreei Howard, Dyar & Knab (in part, not Coquillett), Mosq. No. & Cent. Am. & W. I., iv, 781, 1917.

Aedes oligopistus Dyar, Ins. Ins. Mens., vi, 76, note, 1918.

Aedes (*Ochlerotatus*) *oligopistus* Dyar, Ins. Ins. Mens., vi, 76, 1918.

Aedes (*Heteronycha*) *oligopistus* Dyar, Ins. Ins. Mens., viii, 105, 1920.

Two male specimens from Trinidad are all that are before me, the female being unknown. The mesonotum is entirely silvered across in the male sex.

The larva has the upper head-hair single, lower in twos; skin sparsely granular; lateral comb of eighth segment of eight large, well separated, sharply pointed scales, without lateral

fringe; anal segment ringed by the plate; air-tube delicate, pointed at the tip, about three times as long as wide, the pecten of four scales at the base, followed by a large 10-haired tuft. The anal gills are missing in the specimen; the small rounded distinct tracheae run into the air-tube.

The known larvae may be separated as follows:

Anal segment ringed by the plate.

Pecten of air-tube with detached teeth outwardly; lateral comb of eighth segment in a large triangular patch.....*fulvus* Wiedemann

Pecten of air-tube uniform; lateral comb with scales in a nearly straight row.

Air-tube short and thick.

Lateral comb with about ten scales (9-11).

Hair tuft of tube at end of pecten or beyond it,

serratus Theobald, *nubilus* Theobald

Hair tuft well within the pecten,

tormentor Dyar & Knab

Lateral comb of six scales.....*atlanticus* Dyar & Knab

Air-tube long and slender.

Air-tube pecten of four scales.....*oligopistus* Dyar

Air-tube pecten of about eight scales; anal gills very long and coarsely tracheate.....*dupreei* Coquillett

Anal segment not ringed by the plate.....*knabi* Coquillett

The larvae of *eucephalaeus*, *hastatus*, *hortator* and *mathisi* are unknown.

NEW AMERICAN MOTHS

(*Lepidoptera*)

BY HARRISON G. DYAR

Family NOCTUIDAE

Subfamily AGROTINAE

***Euxoa clavigera*, new species.**

Fore wing rather dark gray, the stigmata and subterminal space light gray filled; subbasal space tinged with dull luteous centrally; inner line black, double, of three sections, those on costa and internal margin a little further out than the central

portion. Stigmata with narrow black margins, the claviform long, orbicular large and full, reniform large, the center slightly darker, a few white scales at its lower angle on veins 3 and 4. Outer line geminate, denticulate, the veins dark crossing the subterminal space; subterminal line indicated, pale, dentate; terminal space blackish shaded. Hind wing fuscous, pale on the disk, with lunate discal mark. Male antennae with rather long pectinations. Expanse, 32 mm.

Type, male, No. 25291 U. S. Nat. Mus.; Mexico City, Mexico, October, 1921 (R. Müller).

***Anytus marloffi*, new species.**

Dark bluish gray, lightly sprinkled with whitish scales. Inner line indistinct, blackish, curved, indented on median vein and vein 1, the black-outlined claviform resting on it, with a point on submedian fold. Orbicular large, contrastingly pale filled, produced outward in a point touching reniform; the latter more obscurely pale filled, faintly dark-edged; a black streak on veins 2 and 3. Outer line dentate, single, dark, followed by a pale gray border, with white points on veins 2 and 3; subterminal line shaded, the margins a little irregular. Hind wing dark, blackish powdered, with faint pale nearly mesial line and pale discal dot. Expanse, 37 mm.

Type, No. 25417, U. S. Nat. Mus.; Wallace, Idaho, June 29, 1921 (F. Marloff).

Subfamily CUCULLIINAE

***Copicucullia jemezensis*, new species.**

Stigmata obsolete; wing dark gray, the veins narrowly lined with black and with a tendency to lighter gray edges; a long black line on submedian from base to middle of wing; a narrow black line along internal margin; a thick black streak above tornus, from margin at end of vein 2 to submedian fold; indistinct black streaks between the veins outwardly between veins 4 and 5, 6 and 7. Hind wing dark gray the veins darker a little paler basally between the veins: fringes whitish. Expanse, 42 mm.

Type, female, No. 25418, U. S. Nat. Mus.; Jemez Springs, New Mexico, May 20, 1921 (F. Marloff).

Cucullia nanuscula, new species.

Fore wing stone-gray, lines and stigmata obsolete. A long very slender black line from base along submedian; median vein outwardly and veins 2 to 4 narrowly black lined, the line of vein 2 ending at basal third; an irregular macular black shade along costa; subterminal blackish dots, preceded by a faint whitish shade. Hind wing pure white. Expanse, 32 mm.

Type, male, No. 25419, U. S. Nat. Mus.; Jemez Springs, New Mexico, May 12, 1921 (F. Marloff).

Subfamily ACRONYCTINAE

Acronycta exempta, new species.

Fore wing bluish gray, the reniform a contrasting dark red-brown cloud. Lines as in *albarufa* Grote, less sharply marked, illy contrasted. Orbicular obscure; reniform without white edging, the rusty brown cloud filling the whole area. Hind wing suffused with fuscous. Expanse, 34 mm.

Type, female, No. 25420, U. S. Nat. Mus.; Jemez Springs, New Mexico, June 27, 1921 (F. Marloff).

Perigea caustimargo, new species.

Fore wing reddish brown, the markings much obscured in the male, distinct in the female. Reniform large, pale yellowish and diffused, a rather conspicuous pale streak in line with the median vein to other line. This marking is common to both sexes, which otherwise have a dissimilar habitus. Outer margin and fringe tinged with burnt brown, this also in both sexes. In the female, lines geminate, dark, the inner dislocated in cell and submedian, the outer excurved above, with points on the veins; subterminal shade pale, wavy, somewhat diffused. Hind wing fuscous, rather darker in the male than in the female; fringe reddish. Expanse, male, 31 mm.; female, 30 mm.

Types, male and female, No. 25292, U. S. Nat. Mus.; Mexico City, Mexico, September and October, 1921 (R. Müller).

Elydna graphicomas, new species.

Fore-wing ground-color grayish clay, thickly irrorate with dark brown; three dark brown lines, the outer two excurved in a point and joined by a dash that runs from the cell to outer margin through the points of the lines; termen and fringe dark. Hind wing brown, with two faint lines, angled outward in imitation of those on fore wing, but without the joining dash. The male seems rather lighter in color, but this may be due to fading; hind wing lighter, the lines indistinct; a dark gray anal tuft in male only. Expanse, male, 33 mm.; female, 35 mm.

Types, male and female, No. 25293, U. S. Nat. Mus.; Guerrero, Mexico, August, 1921 (R. Müller).

Subfamily MOMINAE

Diphthera egua, new species.

As in *palata* Grote, smaller, darker gray, the lines less contrasted and alike, or the subterminal heaviest; bar between the inner and outer lines faint or wanting; stigmata small and indistinctly margined. Hind wings white, with dark terminal line and slight powderings outwardly. Expanse, 33 mm.

Types, two males, No. 25421, U. S. Nat. Mus.; Las Vegas Hot Springs, New Mexico, June 6, 1907 (H. S. Barber); Jemez Springs, New Mexico, June 7, 1921 (F. Marloff).

Subfamily ERASTRIINAE

Taseopteryx inquieticolor, new species.

Fore wing olive gray and white with black lines. Basal space broadly olive gray, bounded by a slightly irregular, distinct black line; median space white inwardly, olive gray outwardly; outer line black, slender, somewhat irregular and excurved mesially, followed narrowly by white, more broadly so at costa; subterminal line whitish, lost centrally, preceded by a subapical blackish streaked cloud and a curved black shade above tornus; terminal black dots between the veins. Hind wing brownish fuscous. Expanse, 20-22 mm.

Types, two females, No. 25422, U. S. Nat. Mus.; Stemper,

Hillsboro County, Florida, September 7 and October 2, 1911 (F. Marloff).

One of the types returned to the collection of Mr. Fred Marloff.

Subfamily HYPENINAE

Megachyta pulchellescens, new species.

Fore wing dark purplish brown, the lines black blotched and contrasted; reniform a large rounded yellowish cloud containing two black points; orbicular distant, a yellowish point in a black ring; subbasal and inner lines blotches, heaviest on inner margin, there separated by a rounded yellowish mark; an indistinct median blackish cloud; outer line oblique and denticulate, slightly excurved at median vein, blotched opposite cell; subterminal line pale irregular, blotched with black in the angles, especially opposite cell; a looped terminal black line. Hind wing brown, with faint dark median band. Expanse, 31 mm.

Type, male, No. 25294, U. S. Nat. Mus.; Misantla, Mexico, August, 1921 (R. Müller).

Family EPIPLEMIDAE

Epiplema anodontia, new species.

Fore wing gray with slight brown shading; inner and outer lines brown, broken through mesially, conjoined, forming a large angular loop on costa and a thickened arc on inner margin; a straight dark mark on termen between vein 3 and apex. Lines on hind wing separate and parallel, irregular. Expanse, 18 to 20 mm.

Types, male and female, No. 25295, U. S. Nat. Mus.; San José, Costa Rica, October, 1906 (W. Schaus); Guerrero, Mexico, September, 1921 (R. Müller).

Similar to *brevidens* Dognin, smaller, grayer, the lines indistinctly or not filled in with discolorous brown.

Family GEOMETRIDAE

Subfamily GEOMETRINAE

Diastictis berta, new species.

Light gray, slightly powdery; fore wing with a small round

dark gray discal dot and single outer line, nearly straight, finely wavy on the veins. Hind wing similar, faintly yellowish tinted toward base. Beneath yellowish with brown irrorations, lines repeated, fore wing dark gray basally. Expanse, 21 mm.

Type, female, No. 25296, U. S. Nat. Mus.; Guadalcázar, San Luis Potosi, Mexico, October, 1921 (R. Müller).

Named, at the suggestion of Mr. Müller, for Mrs. Dr. Wittich of Guadalcázar.

Selenia isolde, new species.

Fore wing light gray, marbled with olive brown; inner line bent at right angles in cell; discal dot round, black; outer line with a sharp angle at vein 7, obliquely incurved, indented by vein 1; subterminal line whitish, broadly waved, followed by a brown area at apex and cutting a broad brown cloud below vein 4; outer line preceded by a brown area, with a horizontal line from costa to vein 6. Hind wing shaded with brown, outer and subterminal lines and discal dot similar to fore wing. Expanse, 35 mm.

Type, male, No. 25297, U. S. Nat. Mus.; Guerrero, Mexico, November, 1921 (R. Müller).

Very similar to the male of *cacocore* Dyar and possibly a bright variety; the lines, however, are narrower and more contrasted, and on the hind wing below there is no second line across the disk between the discal dot and outer line, as occurs in *cacocore* and *eucore* also.

Subfamily LARENTIINAE

Tephroclystia lechriotorna, new species.

Fore wing light gray, darker and brownish on terminal field; subbasal line black, distinct, thicker on costa, angled outward on submedian fold; inner line slender except on costa, sharply angled outward in cell, touching the large black lunate discal mark; outer line black, thick on costa, straight across the wing, touching discal mark; a thick black dash obliquely inward from tornus, almost touching outer line; a terminal black line. Hind wing with median nearly straight line, minute discal dot and

terminal black line; subterminal line forming a series of angular scallops on the veins. Expanse, 18 mm.

Type, female, No. 25298, U. S. Nat. Mus.; Mexico City, Mexico, October, 1921 (R. Müller).

Tephroclystia dustica, new species.

Fore wing thin gray, the lines obsolete; discal mark a conspicuous ringlet; black blotches on costa, the one beyond cell largest; a series of black dots on median vein, indicating faint wavy cross-lines, two beyond cell somewhat more distinct; termen darkly shaded, the subterminal line showing as a series of white specks. Hind wing with dark discal dot, the inner margin with a series of dark and pale wavy bands, a subterminal wavy dark line crossing the wing. A broken dark terminal line. Expanse, 20 mm.

Type, female, No. 25299, U. S. Nat. Mus.; Mexico City, Mexico, August, 1921 (R. Müller).

Family PYRALIDAE

Subfamily PHYCITINAE

✓ **Promylea mindosis**, new species.

Fore wing long and narrow, lustrous dark gray, blackish shaded; inner indistinct, inner straight, strongly outwardly oblique; discal mark annular; outer line dark, excurved mesially. Hind wing translucent fuscous. Expanse, 25–26 mm.

Types, two males, one female, No. 25300, U. S. Nat. Mus.; Mexico City, Mexico, August, 1921 (R. Müller).

✓ **Promylea dasystigma**, new species.

Similar to *mindosis*, darker, blackish; inner line straight across wing, obscure, preceded by paler; discal mark double, conjoined; outer line followed by white, forming a distinct spot on vein 1. Expanse, 25 mm.

Types, two females, No. 25301, U. S. Nat. Mus.; Mexico City, Mexico, August, 1921 (R. Müller).

✓ **Rampylla nefas**, new species.

Fore wing long and narrow; blackish gray, basal space light

gray; inner line oblique, straight, followed by broad blackish shading; discal dots obliquely placed, joined by a line; outer line pale, near the margin, shortly excurved mesially. Hind wing translucent, pale fuscous tinged. Expanse, 19–20 mm.

Types, two males, No. 25302, U. S. Nat. Mus.; Mexico City, Mexico, September, 1921 (R. Müller).

✓ ***Zophodia bihinda***, new species.

Fore wing gray, broadly whitish on costa, the white area crossing the median vein centrally; inner line a faint blackish oblique shade, crossing the whitish area, then lost; outer line blackish, from apex inwardly, a little excurved and denticulate on discal venules, lost below; a double discal mark, the upper point small. Hind wing semitranslucent whitish with faint yellowish fuscous tint. Expanse, 34 mm.

Type, female, No. 25423, U. S. Nat. Mus.; Jemez Springs, New Mexico, July 7, 1921 (F. Marloff).

✓ ***Ephestia majorella***, new species.

Fore wing dark gray with a reddish brown tint; inner line at middle of wing, black, thick, irregularly waved; discal dots conjoined; outer line nearly erect and parallel to inner, more oblique near costa, followed by lighter. Hind wing dark fuscous. Expanse, 20 mm.

Type, male, No. 25303, U. S. Nat. Mus.; Guadalajara, Mexico (Schaus Collection).

Labelled "*?micaceella* Rag," by Sir G. F. Hampson, but separable by the dark hind wings.

NEW FORMS OF CERURA

(*Lepidoptera*, *Notodontidae*)

By HARRISON G. DYAR

Mr. F. H. Benjamin, who is working on the Barnes Collection at Decatur, Illinois, called my attention to some apparently new forms in this genus, which compelled me to reexamine the National Museum material. The following new

forms, therein contained, do not conflict with any of those which Mr. Benjamin has in mind.

Cerura occidentalis deorum, new subspecies.

Very similar to *occidentalis gigans* McDunnough (Can. Ent., liv, 139, 1922) from Alberta and British Columbia (I possess a specimen from Rossland, B. C.); still larger, the inner band as black, much wider and passing straight across the wing.

Type, male, No. 25795, U. S. Nat. Mus.; Manitou, Colorado, May 3, 1891, taken at electric-light (H. G. Dyar).

Cerura scolopendrina pluvialis, new subspecies.

The fore wings appear more broadly trigonate than usual; markings diffused and blurred, the three lines beyond the cell not narrowly written as usual, but tending to form dots on the veins.

Types, two males, No. 25796, U. S. Nat. Mus.; Albina, Oregon, May 18, 1892, taken at electric-light (H. G. Dyar).

C. scolopendrina scolopendrina pervades the whole of the arid region from southern California to Colorado, Montana (Miles City, C. A. Wiley), eastern Washington (Pullman, C. V. Piper), and Alberta (Red Deer River, F. H. Wolley Dod), as well as going southward to Arizona (Washington Mts.). The name *albicoma* Strecker appears a straight synonym.

Cerura cinerea wileyi, new subspecies.

A large form like *nivea* Neumoegen, nearly white, the lines and bands faint, gray and powdery as in *meridionalis* Dyar, but the terminal dots large and distinct on both wings.

Types, male and female, No. 25797, U. S. Nat. Mus.; Miles City, Montana, May 12, 1891 (C. A. Wiley).

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NEW SPECIES OF HELOMYZIDAE

(*Diptera*)

By C. B. D. GARRETT

Amoebaleria bisetata, new species.

Male. Color red-yellow-brown, except base of each abdominal segment, which is gray-black. Foremost fronto-orbital almost equal to the hind one, two pairs of strong vibrissae, two pairs of prosternal bristles separated, mesopleura with about 7 strong bristly hairs up the posterior third, one humeral, four dorso-centrals. Entire head and antennae red-yellow, arista dark brown, pubescent. Three wide rows of hairs below the vibrissae. Dorsum of thorax brownish red-yellow, signs of a gray pruinosity, evenly covered with short thick black hairs. Dorso-centrals arise from dark red-yellow spots; scutellum with two pairs of bristles. The pin has been run through the pteropleura end, everything seen is red-yellow. Propleura one bristle, mesopleura from near the wing base to lower three-fourths two rows of strong bristly hairs, and below the disk one bristly, and 7 or 8 villose. Sternopleura two strong bristles on posterior dorsal edge, slightly below these and in front to the mid dorsal line about 6 short hairs. Mid portion bare, sternite part all strong short hairs with a row of 7 bristles in front of the mid coxae. What is seen of the pteropleura is bare. Abdomen red-yellow all the last segment, the others for the basal half or more gray-black. Legs red-yellow, tarsi 4 and 5 gray-black. Wings entirely hyaline, veins brown, costal spines prominent.

Monotype, male, Teulon, Manitoba, May 31, 1920, from the collection of H. C. Curran, who has been kind enough to allow me to keep the type.

Anorostoma currani, new species.

Male. Foremost fronto-orbital about one-third of the hind one, no prosternal bristles, 4 dorso-centrals, two and a small meso-pleural bristle. Entirely yellow, with a brownish tinge in parts. Head and antennae yellow viteline; arista black; pubescent. One thin vibrissae, a row of few hairs below, widely separated from the mouth, two short bristles at the lower corner of the mouth. Thorax with few scattered hairs, black. All bristles and dorso-centrals about equal in length and rather long, scutellum two pairs of bristles. Lower half of pleura more opaque, light brown. Propleura one strong bristle, mesopleura at about upper of posterior edge, two strong and one small bristle, the rest bare. Sternopleura one strong and a thin bristle on top hind corner, a sparse row of hairs (4) down the center. The lower third all hair and bristles. Pteropleura has the pin through. Abdomen, yellow (brownish), with scattered short black hairs. Hypopygium covered with long hairs, distinctly villose and as long as the apical abdominal bristles. Legs all yellowish, fore femora tumescent, hind one much ventose, all hairy and bristly; mid femora below with a row of flexor bristles. The tibiae and first tarsal joint below conspicuously long-villose. Wings yellow hyaline, veins dark yellow, cross-veins clouded blackish, costal spines rather small.

Monotype, Teulon, Manitoba, August 28, 1920. From the collection of C. H. Curran, who has been kind enough to allow me to keep the type.

Leria serrata, variety **nigricana**, new variety.

Similar to *serrata*, but the entire abdomen is an even dark gray-black, appearing velvety opaque, each segment has a very narrow apical margin of red-yellow. Thoratic dorsum smoky gray, trivittate, darker, with a brownish tinge, one more or less connected through the dorso-centrals, and one median, not reaching the scutellum. [Five dorso-centrals on one side, abnormal.] Legs red-yellow.

Monotype, female, June 4, 1921; Cranbrook, British Columbia (C. Garrett).

Leria serrata, variety **vinus**, new variety.

Similar to *serrata*, but all the abdominal segments, excepting the last, the color of Indian red, often overlaid with some gray-black. Dorsal surface of abdomen smooth, almost shining. Fore femora usually blackish, inner side deep red-yellow. Size small, about 3 to 4 mm. Usually only one vibrissa.

I have selected seven specimens to represent the type series. Males and females, Cranbrook, British Columbia, March 20 to April 8; a female, Michel, British Columbia, August 2.

It is a small form found in the earliest spring, gradually mixing with a lighter form whose abdomen is red-yellow with scattered patches of dark or black, which runs into the summer form, which has a clear almost yellow abdomen contrasting greatly with the thoracic color.

ADDITIONS AND CORRECTIONS

To my paper, "Notes on Helomyzidae," etc., in *Ins. Ins. Mens.*, vol. 9, nos. 7-9, page 120, at the end of dichotomy 6 add: Mid tibia with two preapical bristles,

Anorostomoides Malloch (*Crymobia* Loew)

Page 130, line 11, insert "it," between "below" and "R3."

Page 132, line 12, "abnormalis" should be "abnormal."

Page 132, line 17, "fuscolineata" should be "fuscolinea."

NEW SPECIES OF JAPANESE CRANE-FLIES

PART III

(*Diptera*, *Tipulidae*)

BY CHARLES P. ALEXANDER

The species of *Tipulidae* described in this paper were collected by Dr. Kichizo Takeuchi in the vicinity of Gifu and on Mounts Ibuki and Minomo, Central Honshiu. I am very greatly indebted to Dr. Takeuchi for this series of Japanese crane-flies. The types are preserved in the writer's collection.

Geranomyia multipuncta, new species.

Male.—Length, excluding rostrum, about 6.2 mm.; wing, 8.1 mm.; rostrum, about 2.5 mm.

Female.—Length, excluding rostrum, about 7.5 mm.; wing, 9 mm.; rostrum about 2.6 mm.

Rostrum and palpi dark brown. Antennae dark brown throughout. Head dark gray with a narrow, longitudinal, light gray median line on vertex; vertex between eyes silvery white.

Mesonotal praescutum obscure yellow, the dorsum occupied by three completely confluent brownish gray stripes, leaving the humeral region and the lateral margins of the ground-color; scutum gray, the mesal margin of each lobe with a narrow blackish longitudinal line; scutellum light gray with a capillary black median line; postnotum brown, sparsely dusted with gray. Ventral pleurites obscure reddish yellow, the dorsal pleurites infuscated, pruinose. Halteres yellow, the knobs dark brown on the distal half. Legs with the coxae and trochanters yellow; femora and tibiae obscure brownish yellow, the terminal tarsal segments darkened. Wings with a faint brownish tinge, the base and costal region yellow; a conspicuous brown pattern, including seven larger costal areas, the first in the bases of cells *Sc* and *R*; the second with a pale center in cell *R*; third at origin of *Rs*, extending from *C* almost to *M*; stigmal spot large, connected with a spot in the basal third of cell *R*₅; terminal spots at ends of veins *R*₂+₃ and *R*₄+₅; smaller spots in cell *C*; a series of spots and blotches along vein *Cu* in cell *M* and caudad of the vein in cell *Cu*; cord and outer end of cell 1st *M*₂ seamed with brown; small brown spots at ends of anal veins, that on 2nd *A* larger; brown dots near base of cell 1st *A* and, in cases, in bases of cells *R* and 2nd *A*; veins brown, bright yellow in the costal region except where they traverse dark areas. Venation: *Sc* long, *Sc*₁ ending opposite midlength of *Rs*, *Sc*₂ at tip of *Sc*₁; *Rs* angulated and spurred at origin; cell 1st *M*₂ elongate, gently widened distally, longer than any of the veins beyond it; basal deflection of *Cu*₁ beyond the fork of *M*.

Abdominal tergites brown, the sternites yellow. Mesal face of pleurites of hypopygium produced into a long, very slender, curved spine.

Holotype, male, Gifu, May 1, 1921 (K. Takeuchi).

Allotopotype, female.

Dicranomyia (Euglochina) curtivena, new species.

Male.—Length, 7 mm.; wing, 6.8 mm.

Rostrum obscure yellow, the palpi dark brown. Antennae dark brown. Head dark brown, the anterior part of the vertex pale.

Thorax pale brown, the pleura indistinctly pruinose. Halteres very long, pale, the knobs brown. Legs with the coxae and trochanters concolorous with the pleura; femora and tibiae black; tarsi white. Wings faintly infuscated, especially the apex beyond the cord; stigma barely indicated, very pale; veins brown. Venation: Sc short, the distance between the tip of Sc_1 and the origin of Rs about one and one-half times the distance from the origin of Rs to the tip of the vein R_2+3 , Sc_2 close to the tip of Sc_1 ; Rs angulated and spurred just beyond midlength, r at tip of R_1 ; deflection of R_4+5 a little shorter than Rs ; cell $1st\ M_2$ a little longer than vein Cu_1 beyond it; basal deflection of Cu_1 from one-third to one-fourth its length beyond the fork of M ; origin of vein $2nd\ A$ in the anal angle immediately distad of the level of arculus.

Abdominal tergites dark brown; sternites obscure yellow.

Holotype, male, Gifu, September 3, 1921 (K. Takeuchi).

Dicranomyia (Euglochina) curtivena is very distinct from the type of the subgenus, *D. (E.) saltens* (Dol.) (syn., *D. cuneiformis* Meij.) in the details of venation. The specimen determined by Brunetti (Fauna British India, Diptera Nematocera, p. 373, 1912) as being this species is obviously not *saltens* and is undescribed. For this species with infuscated bases to the metatarsi (Dawna Hills, India, altitude 2,000–3,000 feet, March 2–3, 1908), I propose the name *D. (E.) fuscibasis*, new species.

Dicranomyia takeuchii, new species.

Male.—Length, 7 mm.; wing, 7.5 mm.

Rostrum and palpi dark brown. Antennal scape black; basal half of flagellum obscure yellow, the terminal flagellar segments passing into dark brown; flagellar segments oval. Head shiny black.

Thorax entirely shiny coal-black, the praescutum with vague metallic reflexions; a small silvery patch on the meospleura ventrad of the wing-root. Halteres yellow, the knobs conspicuously dark brown. Wings subhyaline with a very heavy brown pattern, the base and cells *C* and *Sc* yellow; conspicuous brown areas at base of cells *R* and *M*, reaching costa; at tip of *Sc* and origin of *Rs*, extending from *C* to *M*; mid-distance between the above two, extending from *R* to *M*; a very large stigmal area, connected with a circular area at end of *Rs* and a conspicuous seam along the cord; outer end of cell *1st M*₂ seamed with brown; wing-tip very broadly dark brown; cells *M*, *Cu*, *1st A* and *2nd A* more grayish; veins brown, yellow in the flavous areas. Venation: *Sc* short, *Sc*₁ ending just beyond origin of *Rs*, *Sc*₂ exactly opposite this origin which is angulated and spurred; *r* at extreme tip of *R*₁; deflection of *R*₄+₅ very long, about equal to the first section of *R*₂+₃; cell *1st M*₂ closed; basal deflection of *Cu*₁ about two-thirds its length before the fork of *M*.

Abdomen shiny black, including the hypopygium, the segments narrowly but conspicuously ringed caudally with silvery white.

Holotype, male, Mount Ibuki, June 4, 1921 (K. Takeuchi).

This exquisite crane-fly is named in honor of the collector, Dr. Kichizo Takeuchi.

***Limnobia anthracina*, new species.**

Male.—Length, 8 mm.; wing, 8.6 mm.

Female.—Length, 8.8–9 mm.; wing, 8–9 mm.

Rostrum and palpi brownish black. Antennae with the scape obscure yellow, the flagellum dark brownish black. Head gray.

Thorax shiny black. Halteres yellow, the knobs faintly darkened. Legs with the coxae yellow, the bases of the fore and middle coxae infuscated basally; trochanters yellow; femora yellow, the tips broadly blackened; tibiae dark brown, the tips blackened; tarsi black. Wings with a yellow tinge, the base and costal region clearer yellow; stigma large, oval, brown; cord

and outer end of cell *1st M*₂ narrowly seamed with brown; *Cu* broadly seamed with brown; wing-tip indistinctly darkened; veins dark brown, those in the costal region clear yellow. Venation: *Sc* long, *Sc*₁ ending about opposite two-fifths the length of *Rs*, *Sc*₂ much longer than *Sc*₁ and at its tip; *Rs* long; *r* less than its own length from the tip of *R*₁; inner ends of cells *R*₃ and *1st M*₂ arcuated; basal deflection of *Cu*₁ close to the fork of *M*.

Abdomen brownish black. Ovipositor with the valves long and slender, tergal valves very slender.

Holotype, male Mount Minomo, May 4, 1921 (K. Takeuchi).

Allotopotype, female.

Paratopotypes, 1 male, 5 females.

***Limnobia amatrix*, new species.**

Male.—Length about 7.5 mm.; wing, 10 mm.

Female.—Length about 8.5 mm.; wing, 9.5 mm.

Rostrum and palpi brownish black. Antennae with the basal segment of scape dark brown; remainder of antenna light yellow, the terminal segments scarcely darkened. Head obscure yellow, the center of the vertex darkened.

Pronotum greenish yellow. Mesonotal praescutum greenish yellow with four pale brown stripes, the lateral pair less distinct; scutal lobes conspicuously marked with brown, the median area greenish yellow; scutellum dark brown, the median portion obscure greenish yellow; median sclerite of postnotum dark brown, the sides paler. Pleura brownish yellow with a narrow, dorsal, longitudinal, brown stripe extending from the cervical sclerites to beneath the wing-root. Halteres yellow, the knobs dark brown. Legs with the coxae and trochanters yellow; remainder of the legs black, the tips of the femora narrowly but very conspicuously light yellow. Wings tinged with pale yellow, handsomely variegated with brown; costal cell brown; subcostal cell brown at base, over origin of *Rs* and at tip; a brown seam at base of cells *R* and *M*, continued as a conspicuous seam along vein *Cu* to the wing-margin, narrowly

interrupted near three-fourths the length of vein *Cu*; a conspicuous seam along the whole length of *Rs*; a brown cloud extending from the tip of *Sc* across cells 1st *R*₁ and *R*₃ into cell *R*₅; narrow seams along cord and outer end of cell 1st *M*₂; stigma large, U-shaped; rows of circular brown spots on the veins beyond the cord; wing-tip in cells 2nd *R*₁, 2nd *M*₂ and *M*₃ darkened; conspicuous seams on outer ends of anal veins; narrow but conspicuous marginal seams in ends of all the posterior and anal cells; veins pale, dark brown in the infuscated areas. Venation: *Sc* very long, ending far beyond the end of *Rs*, *Sc*₂ at tip of *Sc*₁; *Rs* extremely arcuated; *r* more than twice its length from the tip of *R*₁ which is arcuated at this point as in *Teucholabis*; cell 1st *M*₂ very long, widened distally; basal deflection of *Cu*₁ about two-fifths its length beyond the fork of *M*.

Abdomen pale brownish yellow. In the female, the base of the abdomen is tinted with green. Ovipositor with the tergal valves bidentate at tips.

Holotype, male, Mount Ibuki, June 4, 1921 (K. Takeuchi).

Allotopotype, female.

Limnobia amatrrix is a beautiful fly that is very isolated in its relationships.

***Ormosia confluenta*, new species.**

Female.—Length about 3–3.3 mm.; wing, 3.6–4.3 mm.

Rostrum obscure yellow, the palpi brown. Antennae with the scapal segments brownish yellow, the flagellar segments pale brownish testaceous to brown. Head obscure brownish yellow, the center of the vertex sometimes infuscated.

Pronotal scutum light brown, the dorso-lateral angles sometimes darkened; scutellum yellow. Mesonotum shiny fulvous brown, unmarked. Pleura yellow. Halteres yellow, the knobs faintly darkened. Legs with the coxae pale, sparsely pruinose; trochanters and femora obscure yellow; tibiae yellowish brown; tarsi dark brown. Wings yellowish fulvous, veins a little darker. Venation: *Sc*₁ ending beyond the fork of *Rs*, *Sc*₂ atrophied;

r on R_2 about its own length beyond the fork; cell 1st M_2 open by the atrophy of m ; basal deflection of Cu_1 a short distance beyond the fork of M ; anal veins divergent.

Abdominal tergites brown, the lateral margins of the segments paler; sternites brownish yellow. Ovipositor with very long valves.

Holotype, female, Mount Minomo, May 4, 1921 (K. Takeuchi).

Paratopotype, female.

Ormosia confluenta is allied to the Alaskan *O. flaveola* (Coquillett).

Dactylolabis diluta, new species.

Male.—Length about 6 mm.; wing, 9 mm.

Rostrum and palpi dark brown. Antennae dark brown. Head dark gray.

Pronotum large, brownish gray, the lateral angles of the scutellum obscure yellow. Mesonotum shiny black with a rather sparse microscopic yellowish pubescence that appears like a pollen. Pleura and sternum light gray. Halteres yellow. Legs with the coxae black, microscopically pubescent; trochanters yellow; remainder of the legs dark brown, the femoral bases somewhat paler. Wings with a strong brownish yellow tinge, the base clear yellow; very diffuse brown clouds, distributed as follows: Origin of Rs , tip of Sc_1 continued caudad along the cord; outer end of cell 1st M_2 ; at r ; fork of M_1+2 ; less distinct clouds at the ends of veins R_2 , Cu_1 , Cu_2 and in cell 2nd A ; veins dark brown, more yellowish at the wing-base. Venation: Sc_1 ending just before the fork of Rs , Sc_2 about twice its length from the tip of Sc_1 ; Rs long; R_2+3 one-half longer than the deflection of R_4+5 ; petiole of cell M_1 about one-half longer than the cell; basal deflection of Cu_1 before the fork of M , the distance about equal to the basal deflection of R_4+5 .

Abdominal tergites dark brown, the basal sternites obscure brownish yellow.

Holotype, male, Gifu, April 20, 1921 (K. Takeuchi).

Dactylolabis flavidipennis, new species.

Female.—Length, 6.3 mm.; wing, 7.2 mm.

Rostrum and palpi dark brown. Antennae with the first scapal segment gray; remainder of antenna black. Head clear gray pruinose.

Pronotum light gray. Mesonotal praescutum gray with four conspicuous dark brown stripes; remainder of mesonotum dark gray, the scutal lobes a little infuscated. Pleura light gray. Halteres yellow. Legs with the coxae yellow, the outer faces pruinose; trochanters yellow; femora and tibiae light brown, the tarsi dark brown. Wings light yellow; very indistinct brown clouds at *r*, along the cord and outer end of cell 1st M_2 ; veins yellow, darker beyond the cord. Venation: Sc_1 ending opposite the fork of Rs , Sc_2 not far from the tip of Sc_1 ; R_2+3 about twice the length of *r-m*; Rs gently arcuated; petiole of cell M_1 short, about three-fifths the cell; basal deflection of Cu_1 at the fork of M .

Abdominal tergites light brown, sternites obscure yellow, with a capillary sublateral black line. Ovipositor very peculiar in structure, the valves very high and compressed, notched at tips.

Holotype, female, Gifu, May 5, 1921 (K. Takeuchi).

Dactylolabis longicauda, new species.

Male.—Length about 6–6.5 mm.; wing, 6.5–7.5 mm.

Rostrum and palpi black. Antennae with the basal segment dusted with gray; remainder of the antenna black. Head gray.

Pronotum light gray with a narrow brown median line. Mesonotal praescutum light brown with four dark brown stripes, the extreme cephalic margin of the sclerite narrowly grayish; scutum grayish brown, the lobes conspicuously dark brown; scutellum and postnotum brownish gray. Pleura gray. Halteres yellow. Legs with the coxae dusted with gray; trochanters obscure yellow; remainder of the legs dark brownish black, the femoral bases narrowly paler. Wings with a uniform brown suffusion, the base indistinctly yellowish; stigma barely indicated; veins dark brown. Venation: Sc_1 ending before the fork of Rs , Sc_2 at its tip; *r* near the extreme

tip of R_1 ; petiole of cell M_1 elongate, varying from a little less than the cell to one-half longer than the cell; in the paratype cell M_1 is narrowed at the wing-margin; basal deflection of Cu_1 at or before the fork of M .

Abdominal tergites dark brown, the sternites and hypopygium paler brown. Male hypopygium with the pleurites very long, the pleural appendage appearing as a continuation of the pleurite, fleshy, on the mesal face at base bearing a conspicuous, curved, semi-chitinized spine.

Holotype, male, Mount Minomo, May 4, 1921 (K. Takeuchi).

Paratopotype, male.

Dactylolabis longicauda differs from the related *D. flavidipennis* chiefly in the coloration of the wings. The two species form a very peculiar group of the genus.

***Pilaria melanota*, new species.**

Male.—Length, 5 mm.; wing, 5.8 mm.

Rostrum brown, the palpi black. Antennae elongate, if bent backward extending to just before midlength of the abdomen; dark brown throughout. Head shiny black.

Mesonotum shiny black, the median area of the scutum and the postnotum obscure yellow. Pleura obscure yellow. Halteres pale, the knobs dark brown. Legs with the coxae and trochanters yellow; remainder of the legs dark brown, the femoral bases narrowly obscure yellow. Wings tinged with brown; stigma not evident; veins darker brown. Venation: Sc_1 almost lacking, ending just beyond two-thirds the length of Rs , Sc_2 at its extreme tip; Rs long, angulated at origin; r practically atrophied, on R_2 shortly beyond its origin; cell M_1 present, a little longer than its petiole; basal deflection of Cu_1 just beyond midlength of cell 1st M_2 .

Abdominal tergites dark brown, sternites yellow.

Holotype, male, Gifu, September 15, 1921 (K. Takeuchi).

***Hexatoma japonica*, new species.**

Male.—Length about 5 mm.; wing, 6.2 mm.

Female.—Length, 4.8 mm.; wing, 6 mm.

Rostrum and palpi brown. Antennae short, pale brown. Head dark brown, sparsely dusted with gray, more conspicuous adjoining the margins of the eyes; vertical tubercle low.

Mesonotum black, very sparsely pollinose, the scutellum and postnotum with an appressed microscopic pubescence. Pleura dark brown with a sparse microscopic pubescence. Halteres brown, the knobs darker. Legs with the coxae concolorous with the pleura; remainder of the legs dark brown, the femora slightly paler at base. Wings with a strong blackish suffusion; veins dark brown. Venation: Sc long, Sc_1 ending opposite the fork of Rs , Sc_2 a little more than its length from the tip of Sc_1 ; r on R_2 at or just beyond the base, sometimes atrophied; R_2+3 about two-thirds the length of R_2 ; basal deflection of Cu_1 at the fork of M .

Abdomen brownish black.

Holotype, male, Gifu, September 5, 1921 (K. Takeuchi).

Allotopotype, female.

Paratopotype, male.

Tricyphona confluens, new species.

Female.—Length, 19 mm.; wing, 16.5 mm.

Rostrum and palpi dark brown. Antennae with the scape and first flagellar segment obscure yellow, the remainder of the flagellum brown; fourteen flagellar segments, the basal ones crowded. Head black, dusted with gray.

Mesonotal praescutum obscure yellow with a very broad and conspicuous median brown stripe and much less conspicuous lateral stripes; scutum yellow, the lobes conspicuously darkened; median area of scutum at suture and posteriorly with narrow, darker brown marks; scutellum and postnotum pale brown, sparsely dusted. Pleura pale tawny, the sternites slightly infuscated. Halteres elongate, yellow. Legs with the coxae and trochanters yellow; femora dark brown, the bases narrowly but conspicuously yellow; tibiae pale brown, the tips darkened; tarsi dark brown. Wings with a strong yellowish tinge, cells C and Sc more saturated; stigma large, yellow, faintly outlined with brown; narrow brown seams at Sc_2 , origin of Rs

and along the cord; veins dark brown, paler in the costal region. Venation: Sc_2 far before the origin of Rs , Rs strongly arcuated at origin; $r-m$ connecting directly with Rs about one-half its length before the distal end of the sector; R_2 connecting with R_1 almost at the extreme tip of the latter; R_4+5 about twice $r-m$; cell 1st M_2 open by the atrophy of m ; cell M_3 only a little shorter than cell M_1 ; basal deflection of Cu_1 about two-thirds its length beyond the fork of M , the fusion extensive.

Abdomen obscure yellow, the tergites with a continuous, relatively narrow, dark brown median line.

Holotype, female, Gifu, May 10, 1921 (K. Takeuchi).

Nesopeza albitibia, new species.

Male.—Length about 9 mm.; wing, 9.3 mm.

Rostrum yellow, the palpi brown. Antennae relatively elongate, if bent backward extending beyond the base of the abdomen; scape light yellow; first flagellar segment obscure yellow; remainder of flagellum dark brown. Head brown, the anterior part of vertex yellow.

Thorax brown without distinct markings, the pleural region crushed. Halteres yellow, the knobs conspicuously dark brown. Legs with the coxae brownish yellow; trochanters yellowish testaceous, the tips narrowly dark brown; tibiae white, the tips of the posterior tibiae narrowly black; anterior tibiae slightly infuscated, the extreme base and a broad subterminal area white, the tips narrowly black; tarsi white. Wings with a strong brown tinge, the stigma dark brown; a conspicuous white spot before and beyond the stigma; veins dark brown. Venation: Generally as in *N. taiwania* Alex.; Sc longer; petiole of cell M_1 only about one-half the length of the petiole of cell M_2 ; fusion of M and Cu slight; cell 2nd A narrow.

Abdomen dark brown, the tergites indistinctly ringed with pale; sternites more distinctly bicolorous, the apical half of the segments distinctly obscure yellow, the basal half dark brown. Hypopygium chestnut-brown.

Holotype, male, Mount Ibuki, June 4, 1921 (K. Takeuchi).

Tipula annulicornuta, new species.

Male.—Length, 15 mm.; wing, 18 mm.

Frontal prolongation of the head brownish yellow; palpi pale brown. Antennae of moderate length, obscure yellow, basal flagellar segments a little darker basally, the terminal segments more uniformly dusky. Head brownish yellow.

Mesonotal praescutum obscure yellow with three brownish yellow stripes, the median stripe slightly darker anteriorly; remainder of mesonotum yellow. Pleura whitish yellow. Halteres pale, the knobs brown with yellow apices. Legs with the coxae concolorous with the pleura; trochanters yellow; femora and tibiae yellowish brown, the tarsal segments dark brown; legs long, metatarsi only a little shorter than the tibiae. Wings tinged with grayish yellow, the base and cells *C* and *Sc* more saturated, yellow; stigma bicolorous, the base yellow, the distal third brown; a very conspicuous oblitative area before the stigma, extending from *Sc*₂ into the base of cell *M*₃, almost filling cell 1st *M*₂; veins brown. Venation: *R*₂ preserved; cell 1st *M*₂ small, pentagonal.

Abdomen brownish yellow. Male hypopygium with the ninth tergite small, the caudal margin with two long, widely separated spines. Outer pleural appendage very small, cylindrical. Dorsomesal angle of ninth sternite with a dense brush of short yellow setae, immediately basad of which arises a powerful chitinated arm, bent laterad for a short distance and thence caudad and dorsad. Eighth sternite with a median brush of setae, on either side of which arises a chitinated spine that bears numerous, parallel, ridges for its whole length, the whole appearing like the horns of certain antelopes, these spines decussate.

Holotype, male, Gifu, May 10, 1921 (K. Takeuchi).

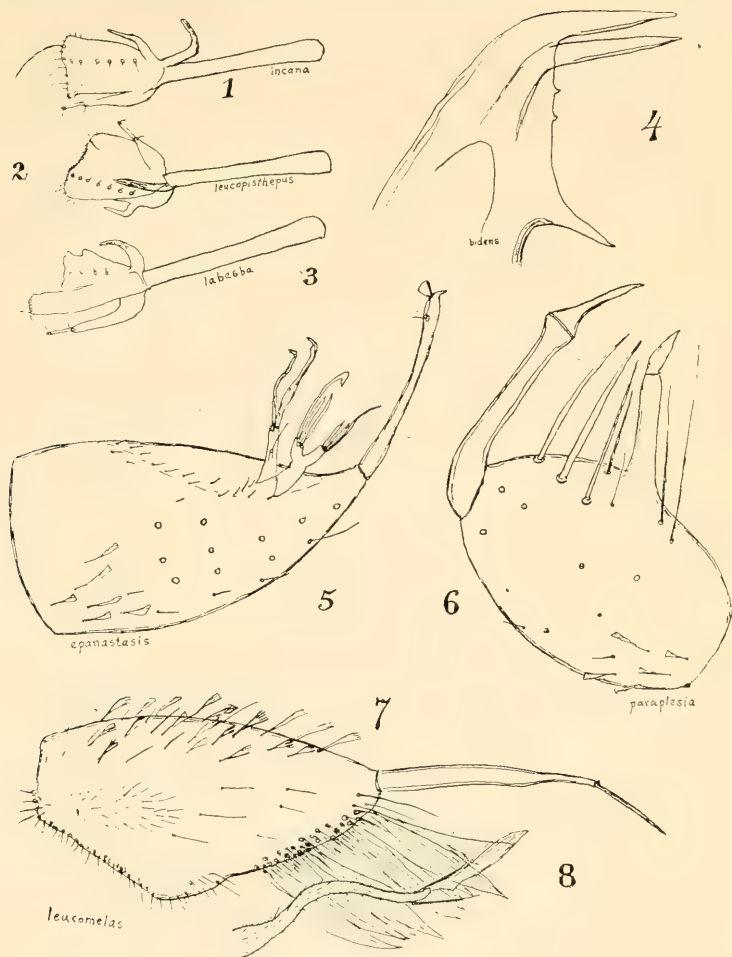
NOTES ON TROPICAL AMERICAN MOSQUITOES

(*Diptera, Culicidae*)

By HARRISON G. DYAR

Wyeomyia (Wyeomyia) labesba Howard, Dyar & Knab.

Mr. J. B. Shropshire bred this species from an "air-plant"



EXPLANATION OF PLATE

1. Clasper of *Wyeomyia incana* Dyar.
2. Clasper of *Wyeomyia leucopisthepus* D. & K.
3. Clasper of *Wyeomyia labesba* H., D. & K.
4. Mesosome of *Culex bidens* Dyar.
5. Side piece and clasper of *Culex (Chocroporpa) epanastasis* Dyar.
6. Side-piece and clasper of *Culex (Carrollia) paraplesia* Dyar.
7. Side-piece and clasper of *Haemagogus (Stegoconops) leucomelas* Lutz.
8. Claspette of *Haemagogus leucomelas* Lutz.

and obtained several males, which sex was heretofore unknown. The coloration is as in the female, except that the male has less of white.

Male hypopygium. Side pieces smooth, without hairs except a few short ones on the outer side before tip; three long ones at the base within crowded closely together. Clasper with a long straight slender stem, the tip trifid; central arm broad, truncate, cleft, one half shorter than the other, the longer portion quadrate, delicately setose on the margin, the shorter portion with a row of four tubercles with recurved spines, the margin expanded and notched near the middle; short arm absent; core separated as a distinct arm, curved, pilose; long arm curved at base, narrowed, with a tubercle and recurved spine at middle and at tip; neither arm prolonged down the stem (Pl. V, fig. 3). Tenth sternites long, curved, dentate at tip; a pair of pointed setose pads beyond. Ninth tergites forming a quadrate bridge, which in the specimen mounted bears two stout spines on one side and three on the other. Eighth segment partially divided and bearing coarse setae on the margin.

In my table of the known males of *Wyeomyia* (Ins. Ins. Mens., vii, 129, 1919), this will fall with *fallax* B.-W. & B. (= *oblita* Lutz); but differs in the shape of the clasper, the produced part of the mid lobe being as wide as the short part and equally squarely truncate. (Compare Pl. V, fig. 6 of the reference cited.)

Majagual, Canal Zone, Panama, August 19, 1922 (J. B. Shropshire).

There are no good colorational differences between this and *leucopisthepus* D. & K., the latter species on reexamination proving to have white tips to the prothoracic lobes, thus obliterating the supposed differences.

Wyeomyia (*Wyeomyia*) *incana*, new species.

A small slender species of the shape and coloration of *labesba* and *leucopisthepus*, differing in the structure of the male hypopygium.

Male hypopygium. Side pieces long and slender, the tips curved down ventrally; some scales and fine setae on the terminal aspect; three long hairs close together near base. Clasper with long slender stem, the tip expanded and trilobed; central lobe broadly expanded, squarely ended (Pl. V, fig. 2), with rather long fine setae on margin, sparsely placed, and a longitudinal row of eight tubercles with recurved setae; central core detached as a separate arm, rather long, recurved, slightly pilose-striate; short side-arm bent at right angles; long side-arm as long as the middle lobe or longer, with middle and terminal seta. Tenth sternites long, slender, with curved dentate tip. Another pair of appendages within, curved, spinose-crested, pointed, but apparently not furcate-beaked as in *leucopisthepus*. Ninth tergites quadrate, stout, with two long setae on each side.

Types, male and female, No. 25759, U. S. Nat. Mus.; Margarita, Canal Zone, Panama, August 12, 1922, bred from larvae found in wild pine-apple plants (J. B. Shropshire).

Wyeomyia (Miamiya) hosautus Dyar & Knab.

Wyeomyia hosautus Dyar & Knab, Journ. N. Y. Ent. Soc., xv, 211, 1907.

Wyeomyia symmachus Dyar & Knab, Smith. Misc. Colls., Quart. Iss., lii, 262, 1909.

Wyeomyia euethes Dyar & Knab, Smith. Misc. Colls., Quart. Iss., 263, 1909.

This species was held apart on a single female, as supposedly having a distinct white tip on the prothoracic lobes. The white tip, however, is in reality faint, and there is no difference discernible between this and the better known *symmachus*. The name *hosautus* is the older and will take precedence.

Culex bidens, new species.

Head brown on the vertex, with white scales on the sides, scaled as in *Culex* proper. Mesonotum bronzy brown scaled. Abdomen black dorsally in the female, with basal white bands in the male, widened centrally; small basal segmental lateral white spots; venter whitish scaled. Legs black; femora pale

below; tarsi with very minute whitish rings, involving both ends of the joints. Wing scales narrow, dark.

Male hypopygium. Subapical lobe of side-piece with three rods, a filament, a leaf and a seta. Mesosome stout, with two long teeth from the apex, directed outwardly, the margin below long, with minute denticles, ending with a long inner arm (Pl. V, fig. 4). Tenth sternites tufted with spines, the basal arm long, at right angles, curved. Ninth tergites slight, with a row of setae.

Types, one male and four females, No. 25760, U. S. Nat. Mus.; Rosario, Bolivia (Lake Rocagua), November, 1921 (W. M. Mann, Mulford Biological Expedition).

Doctor Mann reports that the country at Rosario is in general open, supporting the Argentine fauna; but that there occur also little islands of forest. The present species apparently belongs to these forest islands, and may have been previously discovered in Brazil in some of the species of Theobald and Lutz which are unknown to me.

Culex (Choeroporpa) epanastasis, new species.

The single male type is much damaged. Proboscis and palpi black, the latter broken, but one remains entangled in the antennae, and appears to have been fully as long as the proboscis. Antennae plumose, the last two joints long and slender. Vertex of head broadly covered with narrow curved golden scales. Mesonotum denuded. Abdomen entirely black. Legs black, the femora narrowly pale beneath, tips of femora distinctly white. Wing-scales black, rather broadly ovate.

Male hypopygium. Side piece broadly triangular, longer than wide; both divisions of the lobe arise together, the inner with a stout columnar stem, with a seta at the middle, two stout, crooked, hooked, infuscated filaments arising at the tip, the inner only a trace inserted basad of the outer; outer division with curved columnar base, forked, the two limbs equal in diameter and length; a seta just before the furcation; outer limb with four narrow filaments, not evenly inserted, the inner one much longer than the others; inner limb bearing the middle

filament near its base, accompanied by a long narrow one; a long filament with hooked tip at the summit. Mesosomal plate terminating in two sharp points, nearly oppositely directed; another sharp point at the middle of the stem. Basal hooks strongly recurved, with spatulate tips, exceeding the mesosomal plate. Articulated plate large. Tenth sternites comb-shaped, the teeth flattened and very broad. Ninth tergites very small, elliptical, setose. Clasper narrowly snout-shaped, slender, scarcely widened, but with the characteristic *Choeroporpa* structure and eye-like seta; tip hooked; terminal spine appendiculate, triangularly widened, nearly as wide as long (Pl. V, fig. 5).

Type, male, No. 25761, U. S. Nat. Mus.; bred from larvae in Arenal River, Toro Point, Canal Zone, Panama, July 19, 1922 (J. B. Shropshire).

Culex (Carrollia) paraplesia, new species.

Male palpi short, about one-sixth the length of the proboscis; proboscis and palpi black. Antennae plumose. Vertex of head with brown scales, broadly whitish along the eye-margins. Abdomen entirely black above, the venter apparently also dark. Legs blue-black, the femora brown below. Wing-scales black, narrowly ovate.

Male hypopygium. Side pieces elliptical, about twice as long as wide. Clasper with a collar-like enlargement at about the outer third, the part beyond tapering and thorn-like, the spine subterminal, long, appendiculate. A single lobe on the side-piece below the middle, forming a long stout arm, bearing at its tip a single stout tooth-like appendage. Three or four very stout setae between this and the apex. Tenth sternites curved, with comb-shaped tips, containing three or four long slender teeth. Mesosome reduced. Ninth tergites undeveloped (Pl. V, fig. 6).

Type, male, No. 25762, U. S. Nat. Mus.; Puerto Niño, Colombia, February 21, 1922 (Dr. F. A. Miller), communicated by Dr. Wickliffe Rose of the International Health Board.

A female, Palmarito, Colombia, February 13, 1922 (Dr. F. A. Miller), may belong here.

Psorophora confinnis Lynch Arribálzaga.

This species was discussed in the monograph (Howard, Dyar & Knab, Mosq. No. & Cent. Am. & W. I., iv, 599, 1917) under *cingulatus* Fab., and compared with that species and *neoapicalis* Theob. Both of these species have wholly dark wing-scales and a narrow white ring on the proboscis. Arribálzaga's description is silent as to the color of the wing-scales, but he emphasizes the broad white ring of the proboscis. Specimens before me from the Mulford Biological Expedition, Rosario, Bolivia (W. M. Mann), show this character, but have the wing scales black and white. Taken with this form was a typically Argentine fauna, and it is therefore thought correct to identify the species as being the true *confinnis* of Lynch. It is a small *Psorophora* of the *jamaicensis* group, near *funiculus* Dyar; but unfortunately no males are at hand to indicate its exact relationship. The species has recently been recorded from Paraguay (Edwards, Bull. Ent. Res., xiii, 75, 1922).

Aedes euiris, new species.

In describing *Aedes iridipennis* (Ins. Ins. Mens., x, 92, 1922) I mentioned a second specimen from Bogotá, Colombia, which might not be conspecific. The type of *iridipennis* from Arizona proves to be not distinct from *Aedes muelleri* Dyar of Mexico; but additional material of the Colombian form shows that the distinctions noted are constant. It is therefore described under the above name.

Proboscis black. Mesonotum with sparse golden yellow scales, mixed with black ones, indefinitely defining two central lines and a patch on each side before; scales on pleura white. Abdomen black, with white bands at the bases of the segments, that on the second segment triangular, the bands not widened on the sides; venter white, with narrow black bands at the apices of the segments. Legs entirely black, except the femora,

which are pale beneath. Wings iridescent, the scales on the veins black, narrow. Claws of female toothed.

Types, three females, No. 25763, U. S. Nat. Mus.; Bogotá, Columbia, 1918 (Fr. Apollinaire-Marie), in the Museum of Natural History, Paris, France (labeled *iridipennis* ?); a second female with the same data in the same collection (labeled *euiris*, cotype); a third female, Bogotá, Colombia, February 28, 1922 (Dr. F. A. Miller), in the collection of the U. S. National Museum, communicated by Dr. Wickliffe Rose of the International Health Board.

Aëdes milleri, new species.

Proboscis black. Mesonotum with sparse golden scales, arranged in fine longitudinal lines, but diffusely, a central line and one on either side being most distinct; posterior lateral areas dark. Abdomen black, with dorsal triangular white spots, that on second segment produced; venter whitish, with basal median segmental black spots. Legs black, the tarsi rather broadly white ringed on both ends of the joints. Wings iridescent, scales on the veins black. Claws of female toothed.

Type, female, No. 25764, U. S. Nat. Mus.; Bogotá, Colombia, February 28, 1922 (Dr. F. A. Miller), communicated by Dr. Wickliffe Rose of the International Health Board.

Aëdes draconarius, new species.

Proboscis black scaled. Head broadly white on the vertex, the suture narrowly dark, and small black mark low on the sides. Mesonotum with broad yellowish silvery patch covering over the anterior half, faintly cut by two dark lines; posterior portion blackish, the limitation irregular. Abdomen black, with lateral triangular white segmental spots; venter yellowish white scaled, the tips of the segments with very narrow black line. Legs black, the tarsi with narrow white rings at the bases of the first three tarsal joints. Wing-scales dark. Claws of female toothed on fore and mid legs.

Male hypopygium. Side piece conical with long stout hairs within; basal lobe small, with long hairs. Claspette stem

widened at tip, with a small seta, the filament longer than the stem, broadly ribband-shaped with wide tip.

Types, two females and four males, No. 25765, U. S. Nat. Mus.; Saint Laurent, Maroni River, French, Guiana, 1909 (Dr. E. Brimont, Institut Pasteur).

One pair in the U. S. National Museum; one female and three males in the collection of the Museum of Natural History, Paris, France, sent for determination by the kindness of M. E. Séguy of the latter institution.

Nearly allied to *Aedes fluviatilis* Lutz, but differing conspicuously in the form of the claspette filament of the male hypopygium.

Haemagogus (Stegoconops) leucomelas Lutz.

The male of this species has at last come to hand, thanks to the efforts of Mr. J. B. Shropshire. It is a typical *Stegoconops*, with the male palpi nearly as long as the proboscis, the claws of the female toothed. This was the position originally assigned to it by Dr. Lutz, the describer, although it was placed in *Aedes* in the monograph. The white line on the mesonotum is most unusual in a *Haemagogus*.

Male hypopygium. Side pieces conical, about twice as long as wide, with narrow scales and hairs without; inner area broadly densely tuberculate, with fine hairs; a group of long lanceolate scales on the inner margin before apex. Clasper small, narrowed on outer third, the spine long, nearly half the length of the clasper (Pl. V, fig. 7). Claspette slender, the stem strongly curved, pilose, with one small and two stout setae near its tip; filament large, angularly widened near base, expanded and ribbed (Pl. V, fig. 8). Tenth sternites normal, the tips thickened and recurved. Ninth tergites undeveloped.

Bred from a larva found in a tree-hole, Comacho, Canal Zone, Panama, April 22, 1922 (J. B. Shropshire).

Lutz described *Haemagogus leucomelas* in 1904. It was transferred to *Aedes* by Howard, Dyar & Knab in 1917. Meigen described an European species as *Culex leucomelas* in 1804, which Martini places in *Aedes* in 1922 (Ent. Mitteilungen,

xi, 110, 1922). Were it not for the fact that *leucomelas* Lutz is here returned to *Haemagogus*, the name would have to be changed.

NOTES ON THE SYSTEMATIC POSITION OF THE GENUS EUMENOTUS, WITH DESCRIPTION OF A NEW SPECIES

(Hemiptera, Aradidae)

By TEISO ESAKI

The oriental genus of the Aradidae, *Eumenotus*, Westwood, hitherto including a single species, is one of the most remarkable genera of the family from the taxonomic point of view. This genus has been studied by several entomologists, some of whom considered it to belong to the subfamily Aradinae, while others referred it to the Mezirinae. These two subfamilies are well defined from one another, however. During my collecting trip to Formosa last year I captured a specimen of *Eumenotus*, which seems to represent a second and new species of the genus. After a careful study of this specimen I was led to conclude that this genus is sufficiently different from other genera of the Aradidae to be separated under a new subfamily.

EUMENOTINAE, new subfamily

Body moderately thick, very convex beneath. Head much broader than long, bilobed anteriorly, and with a distinct projection in front of eye; no projection behind the eye. Rostrum almost reaching the intermediate coxae. Antenna arising from the latero-ventral part of the anterior lobe. Pronotum broadest posteriorly, not divided into separate lobes. Scutellum very distinct, tongue-like in shape. Hemelytra complete; corium short, being as short as scutellum; membrane distinct, with well defined veins. Trochanters connate with femora. Sternum sulcate. Abdominal spiracles located near the basal margin of each segment.

This subfamily differs from others in the following characters: (1) thick body, which is convex beneath; (2) short and broad head; (3) antenna arising from the anterior lobe of head; (4) much elongated scutellum; and (5) distinct corium, which is scarcely longer than the scutellum. In general, this subfamily seems to be more closely allied to the Aradinae than to the Mezirinae.

Eumenotus pacao, new species.

Male.—Blackish brown. Head very much broader than long, compressed, bilobed anteriorly, with a small but prominent tubercle in middle; an acute projection in front of the eye. Antenna much longer than the head, moderately compressed; first joint not protruding beyond the lobular apex of the head; second joint longest; the third longer than the first; the fourth subequal to the third, somewhat fusiform; apex of the second, apical half of the third, and the whole of the fourth, or the last, joint somewhat darker in color. Rostrum somewhat reddish, very slender, and reaching the intermediate coxae. Eye small, located at the posterior angle of the head, but not touching the anterior margin of the pronotum. Pronotum somewhat trapezoidal in shape, slightly broader than head at the anterior margin; slightly constricted transversely at middle; two irregularly shaped nodules on each side of the anterior area. Scutellum elongate, tongue-shaped in outline, with a slight transverse constriction before the middle, somewhat elevated along the median longitudinal line. Hemelytra well developed; corium short, about as long as the scutellum; membrane reaching the ultimate segment of the abdomen. Legs not modified; coxae separate; tibiae thinner than femora; the first tarsal joint much shorter than the second. Abdomen convex beneath; spiracles near the basal margin of each segment; posterior angle of abdominal segments slightly incrassate and projected; connexivum well defined. Length of body: 8 mm.

Holotype: Male, collected by me at Kappanzan (about 2,000 feet in altitude) near Toyen, Formosa. The specimen was found on the trunk of a fallen tree. Type in my collection.

This species has a close resemblance to the other species of the genus, *Eumenotus obscura* Westwood, differing in (1) being much smaller in size and rather slender, (2) the first joint of antenna not protruding beyond the apex of head, and (3) pronotum being distinctly constricted at middle.

UNDESCRIBED SPECIES OF CRANE-FLIES FROM NEW ZEALAND

(*Diptera*, Superfamily *Tipuloidea*)

By CHARLES P. ALEXANDER

The new species diagnosed in this paper were included in some extensive collections of these flies sent to me by my friends, Messrs. Campbell, Gourlay, Harris, Howes and Watt, to whom I am greatly indebted for many kindnesses in the past. The types are preserved in the collection of the writer.

Family RHYPHIDÆ

Trichocera aperta, new species.

Male.—Length about 3.5 mm.; wing 4.4 mm.

Size larger than in most New Zealand species of the genus. General coloration dark brown, the apex of the second scapal segment paler. Mesonotum indistinctly variegated with testaceous, especially at the suture, median area of the scutum and on the scutellum. Halteres pale at the extreme base. Wings hyaline, iridescent; veins brown. Venation: Sc_1 ending opposite r ; cell 1st M_2 open by the atrophy of m ; $m-cu$ and basal deflection of Cu_1 nearly equal. No macrotrichiae in the cells of the wing.

Male hypopygium somewhat as in *T. lobifera* Alex.; mesal face of each pleural appendage near one-third the length with a conspicuous fleshy lobe. Gonapophyses very complicated, consisting of broad flattened blades, the apex of each set with about a score of powerful spines, the mesal spines very short, gradually increasing in size laterad; caudal margin of this

plate with a deep U-shaped notch near the mesal margin, cutting off a slender slightly curved mesal arm.

Habitat.—New Zealand (North Island).

Holotype, male, Ohakune, altitude 2,060 feet, May 7, 1922 (T. R. Harris).

***Trichocera macrotrichiata*, new species.**

Male.—Length about 3.7 mm.; wing 4.5–4.6 mm.

Generally similar to *T. aperta*, differing conspicuously in the structure of the male hypopygium and the presence of macrotrichiae in cell 1st *A* of the wing.

General coloration paler, especially the pleura and lateral sclerites of the postnotum which are obscure testaceous yellow. Venation: *Sc* extending some distance beyond *r*; cell 1st *M*₂ open by the atrophy of *m*; *m-cu* about one-half the basal deflection of *Cu*₁. Numerous macrotrichiae occupy the greater portion of cell 1st *A*; macrotrichiae of veins somewhat longer than in *T. aperta*. Male hypopygium of simple structure; pleural appendages simple, cylindrical. Gonapophyses of very simple structure, appearing as two slender curved hooks, directed dorsad, decussate above the penis-guard.

Habitat.—New Zealand (North Island) .

Holotype, male, Ohakune, altitude 2,060 feet, April 10, 1922 (T. R. Harris).

Family TIPULIDÆ

***Dicranomyia sponsa*, new species.**

Male.—Length about 4 mm.; wing 5.5 mm.

Rostrum and palpi brownish black. Antennae brownish black, the basal segments of the flagellum subcylindrical, the subterminal segments more oval. Head grayish brown.

Mesonotal praescutum ochraceous with three very conspicuous dark brown stripes, the lateral stripes with the anterior half confluent mesally with the median stripe, restricting the pale interspaces to narrow strips cephalad of the suture; lateral margins of the sclerite faintly darkened; scutal lobes dark brown, the median area paler; scutellum and postnotum dark

brown, sparsely pruinose. Pleura brownish gray with a narrow, velvety black longitudinal stripe beginning behind the fore coxa; posterior pleurites blackened; velvety-black areas on the ventral portions of the mesosternum between the fore and middle legs. Halteres rather long, brown, the base of the stem and the knobs conspicuously yellow. Legs with the coxae brown, the fore coxae darker brown; trochanters obscure yellowish testaceous, remainder of the legs broken. Wings tinged with gray, the center of the disk more nearly hyaline; stigma oval, brown; conspicuous brown clouds at origin of R_s , along the cord and outer end of cell 1st M_2 ; inner ends of cells R and M infuscated, preceded by a conspicuous white obliterative area at arculus; veins brown. Venation: Sc long, Sc_1 extending almost to the end of R_s , Sc_2 at its tip; R_s strongly angulated to almost square at origin, feebly spurred; tip of R_1 atrophied, the end of the vein being a short distance beyond r ; a supernumerary crossvein (the *apparent* tip of R_1) present; cell 1st M_2 long, nearly as long as vein M_{1+2} beyond it; basal deflection of Cu_1 immediately beyond the fork of M .

Abdomen dark brown, the hypopygium a little paler.

Habitat.—New Zealand (North Island).

Holotype, male, Ohakune, altitude 2,060 feet, April 10, 1922 (T. R. Harris).

***Molophilus tridentata*, new species.**

Male.—Length about 2.3 mm.; wing 2.8 mm.

Related to *M. gourlayi* Alexander, differing as follows: The antennae are shorter, the individual flagellar segments not extended into a long, shiny apical portion, this part of each segment being short and inconspicuous; the bead-like appearance of the antennae of *M. gourlayi* is thus largely obliterated. The pleurites are darker colored. R_{2+3} is a little longer. The structure of the male hypopygium offers the most valuable characters for the separation of the two, these being as follows: Pleural appendages more elongate, slender, tapering rapidly to the subacute apex, the appendage without distinct spinulae as in *gourlayi*. The fused gonapophyses terminate in three sub-

equal acute spines, the median spine with microscopic shoulders at the base.

Habitat.—New Zealand (South Island).

Holotype, male, Kaituna, Banks Peninsula, Canterbury, February 18, 1922 (J. W. Campbell).

Gonomyia (Leiponeura) longispina, new species.

Male.—Length about 2.7 mm.; wing 3.7 mm.

Generally similar to *G. (L.) nigrohalterata* Edw., differing as follows: Size smaller. Pleural brown stripe broader, restricting the ground-color, continued caudad across the posterior half of the median sclerite of the mesonotal postnotum. Apices of the knobs of the halteres conspicuously yellow. Wings somewhat more infuscated. Venation: *r-m* not more than twice the deflection of R_{4+5} ; cell 1st M_2 not so strongly narrowed at its proximal end, gradually widened distally; basal deflection of Cu_1 about one-half its length beyond the fork of *M*. Abdomen pale brown, the sternites yellowish. Male hypopygium of the unique type apparently with asymmetrical pleural appendages, the left appendage a slender blackened hook, the right appendage a long, straight black spine, much longer than the corresponding spine of *G. nigrohalterata*.

Habitat.—New Zealand (North Island).

Holotype, male, Ohakune, altitude 2,060 feet, April 9, 1922 (T. R. Harris).

Limnophila stemma, new species.

Male.—Length about 15 mm.; wing 16.4 mm.

Rostrum and palpi brown. Antennae rather elongate, if bent backward extending to beyond the end of the first abdominal segment; scape brownish yellow; flagellar segments black, the basal segments indistinctly paler at the incisures. Head brown, darker on the anterior part of the vertex.

Pronotum obscure orange, the sides of the scutellum darker. Mesonotal praescutum dark brown with four more or less confluent obscure yellow stripes, the intermediate pair becoming infuscated behind; scutellum and postnotum brownish testa-

ceous, the base of the latter dark brown. Pleura yellowish brown, sparsely variegated with darker. Halteres pale brown, the base of the knobs blackened. Legs with the coxae yellowish brown, darker basally; trochanters yellowish brown; femora yellow with a little less than the apical half dark brown, enclosing a conspicuous obscure yellow subterminal ring; extreme tips of the femora pale; tibiae brown, paler basally; tarsi brown. Wings with a strong yellow tinge and with a heavy brown pattern that is in large part ocellate; these circles occur at the base of cells R and M ; at origin of Rs ; at $r-m$; at the basal deflection of Cu_1 ; m and the fork of M_{1+2} ; solid areas at stigma; r ; tips of R_2 , R_3 , and slightly paler solid areas at the ends of the other longitudinal veins, those on the anal veins largest; veins dark brown. Venation: Sc_2 transverse, lying opposite the fork of R_{2+3} ; r at tip of R_1 ; Rs spurred; basal deflection of Cu_1 either before or beyond midlength of cell 1st M_2 ; arculus broken.

Abdominal tergites obscure brown, the posterior margins of the segments a little paler; sternites obscure yellow; hypopygium and subterminal segments brownish; hypopygium large.

Habitat.—New Zealand (North Island).

Holotype, male, Ohakune, altitude 2,060 feet, November 18, 1921 (T. R. Harris).

Paratopotypes, 2 males, November 1–18, 1921.

By Edwards's key to the New Zealand species of *Limnophila*, the present species runs out at couplet 6 by the combination of a transverse Sc_2 and an ocellate wing-pattern. A paratype was sent to Mr. Edwards for comparison with his types of *Limnophila* and he reports it as being unknown to him.

***Limnophila serotina*, new species.**

Female.—Length about 16 mm.; wing 14.6 mm.

Rostrum reddish, the palpi beyond the first segment, dark brown. Antennae rather elongate for this sex, the scapal segments reddish, the basal three or four flagellar segments pale brown, thence passing into black. Head gray.

Pronotum brown, sparsely gray pruinose. Mesonotum shiny reddish brown, darker medially, the lateral margins of the praescutum weakly pruinose; postnotum conspicuously light gray pruinose. Pleura conspicuously light gray pruinose. Halteres pale yellowish brown, the knobs dark brown. Legs with the coxae reddish, sparsely pruinose; trochanters reddish; femora dark brown, the bases broadly orange; a broad (about 2.5 mm.) orange subterminal ring before the narrow (about 1 mm.) brownish black tip; tibiae light brown, the tips narrowly darker; tarsi brown, the subterminal segments with appressed yellow pubescence. Wings very pale yellow, the costal region brighter yellow; the sparse wing-pattern resembles very much that of *Gynoplistia subfasciata* and allies; a small brown spot at origin of Rs ; a brown seam along the cord and on the outer deflection of M_3 ; a small but conspicuous dark brown stigma; a brown seam along vein Cu ; wing-apex conspicuously infuscated; veins dark brown. Venation: Sc_2 at tip of Sc_1 , both beyond the fork of R_{2+3} ; r at tip of R_1 ; Rs square and spurred at origin; R_{2+3} a little longer than the deflection of Cu_1 ; cell M_1 about twice its petiole; vein 2nd A long, ending beyond the origin of Rs ; arcus broken.

Abdomen brown, sparsely pruinose, the subterminal segments darker brown.

Habitat.—New Zealand (South Island).

Holotype, female, Riccarton Bush, Christchurch, Canterbury, April 10, 1922 (E. S. Gourlay).

Cerozodia hudsoni Edwards, **hemiptera**, new subspecies.

Male.—Length 20 mm.; wing 17.6–18 mm.

Female.—Length 16.5 mm.; wing 11 mm.

Generally similar to typical *hudsoni*, differing as follows: General coloration paler brown throughout, especially the abdomen and legs, the latter brownish yellow. Wings of the female well-developed though shorter than in the male (in *hudsoni*, the wings of the female measure only 3 mm.).

Habitat.—New Zealand (North Island).

Holotype, male, Mount Ruapehu, alpine zone, altitude 4,000–5,000 feet, January, 1921 (M. N. Watt).

Allotopotype, female.

Paratopotype, male.

The exact status of this fly is in doubt. The difference in development of the wings of the females of the two races is very conspicuous. If this difference is constant, the present form will deserve full specific rank. Types of this fly were submitted to Mr. Edwards for comparison with his types of *hudsoni*.

Dolichopeza howesi, new species.

Male.—Length 11 mm.; wing 11.8 mm.

Frontal prolongation of the head ochreous; palpi dark brown, the terminal segment reddish with the extreme tip dark. Antennae of moderate length, if bent backward extending to beyond the base of abdominal segment 2; basal segment of scape obscure yellow, darker apically; second segment brownish yellow; flagellum dark brownish black, the segments distinctly enlarged basally. Head light gray, the anterior part of vertex with an indistinct median brown line.

Mesonotum brownish ochreous, the praescutum with three broad, darker brown stripes, the median stripe interruptedly darker medially; scutal lobes dark brown; scutellum obscure yellow; postnotum pale brown, sparsely pruinose. Pleura pale, sparsely pruinose; sternites between the fore and middle coxae darker gray. Halteres elongate, yellow, the knobs a little darker. Legs with the coxae pale, sparsely pruinose; trochanters obscure yellow, darkened apically; femora yellowish brown, this coloration less extensive on the fore femora, the tips darkened; tibiae pale brown, the tips darkened; tarsi brownish black. Wings uniformly tinged with pale brown; stigma and cell *Sc* a little darker brown; veins dark brown; obliterative areas before and beyond the stigma and at the fork of *M*. Venation: *Sc*₁ entirely atrophied; *Rs* oblique in position, in alignment with *Sc*₂; *r-m* elongate, longer than either *Rs* or the fused portion of *Cu*₁+*M*.

Abdomen almost uniformly pale brown, the basal tergite more yellowish brown; hypopygium moderately large, obscure brownish yellow.

Habitat.—New Zealand (South Island).

Holotype, male, Mount Ida, Otago, altitude 4,500 feet, February 20, 1922 (Geo. Howes).

This very distinct fly is named in honor of the collector, Mr. W. George Howes.

NEW SPECIES OF HYDRIOMENA FROM MEXICO AND GUATEMALA

(*Lepidoptera, Geometridae*)

By W. SCHAUS

The following species were collected by J. T. Barnes and myself during our visits to the above countries.

Hydriomena itaria, new species.

Female.—Palpi whitish with a lateral drab spot and a streak at tip. Head, collar, and thorax green; some white on frons; black spots at shoulders and a black point at center of patagia. Abdomen above green on two basal segments, otherwise deep purplish gray irrorated with brown; underneath white. Fore tarsi black with buff rings. Fore wings mignonette green mottled with jade green forming numerous irregular lines on subbasal space below cell, on medial space and just beyond cell, more compact blotches on antemedial space below cell, beyond postmedial line, and on termen; large black costal spots at origin of lines which are chiefly macular; basal spot on costa large, a small spot below cell, and a double black line on inner margin; a fine, but indistinct outcurved subbasal line; antemedial black spots below subcostal, on median and on vein 1, followed by a very broken fine black wavy line; medial line only indicated by costal spot and a short line at cell and vein 2; postmedial costal spot in bent with an irregular outcurved series of small fuscous patches preceded on veins 2-7 by black points;

subterminal with an elongate spot on costa, a point above vein 7, a larger spot below 7, and a small spot below 6, a point below 5 and one below 4; a larger spot below 3, and a line from vein 2 to inner margin; terminal black lines across veins followed by black spots on the yellow green cilia. Hind wings fuscous brown; a fine darker terminal line; cilia gray tipped with white. Fore wings below white slightly suffused with gray; costa yellowish with five small fuscous spots; a large triangular fuscous shade at apex below costa; cilia white tipped with green and with dark spots at veins. Hind wings below white thickly irrorated with mouse gray; traces of a finely dentate postmedial line, a broader subterminal shade, and a terminal dark line; cilia grayish white.

Expanse, 33 mm.

Habitat.—Volcan Santa Maria, Guatemala.

Type.—Cat. No. 25627, U. S. Nat. Mus.

Nearest *R. fassli* Dognin.

Hydriomena bonitusa, new species.

Male.—Palpi and head silvery steel black. Neck and thorax light green; collar and a transverse line on thorax medially steel black. Abdomen above steel black with transverse greenish white segmental spots, underneath gray. Fore wings light yellow green with darker suffusing striae from middle of wing to termen, the markings chiefly fuscous edged with black; a basal fascia; subbasal small spots on costa, median vein, and inner margin; an antemedial spot on costa and irregular fascia from within cell to inner margin; a medial spot on costa with a fine line from it, interrupted, touching antemedial in cell and from vein 2 to inner margin; a triangular postmedial spot on costa, broken, fine, forming oblique streaks across veins 3 and 4, a short streak on 2, below it punctiform, linear; a streak from postmedial above vein 5 suffusing with a broad subterminal line from costa, obsolete from vein 5 to vein 3, then sinuous to inner margin; a spot on costa at apex; a terminal black line expanding at veins; cilia white with black spots at veins. Hind wings silvery gray, also the cilia. Wings below

silvery gray; trace of postmedial and subterminal darker lines; fore wings with a faint medial line, the costa between the lines whitish green.

Expanse, 24 mm.

Habitat.—Volcan Santa Maria, Guatemala.

Type.—Cat. No. 25628, U. S. Nat. Mus.

Near *H. itaria* Schaus.

Hydriomena popoa, new species.

Male.—Palpi and head white, the former with a yellow tinge laterally. Collar and thorax mottled white, green, and black. Abdomen grayish with broad darker transverse shading above. Fore wings green crossed by irregular fuscous or black lines; a broad basal line curved from costa to submedian; subbasal line outbent on costa, angled above median, and vertical to inner margin where it expands somewhat; antemedial fuscous edged with black, constricted and angled in cell, inbent and constricted below fold, expanding and outcurved across vein 1; medial line thick on costa, then fine, sinuous, vertical, rather close to antemedial; postmedial quadrate on costa, then fine, dentate to a spot on discocellular, twice outcurved from veins 4 to 2, and vertical to inner margin; subterminal broader, fuscous edged with black, dentate from costa to vein 4, twice lunular to vein 2, slightly dentate below vein 2; paired trigonate black spots at ends of veins, partly suffusing on tip of vein; a small spot at apex. Hind wings brownish drab, the cilia whitish with dark spots at veins. Fore wings below whitish, the basal third suffused with dark mouse gray; a large, fuscous postmedial space from veins 2 to 7, almost reaching termen and connected with costa by two small fuscous spots. Hind wings below white finely irrorated with light drab; a black point at upper angle of cell; a fine lunular postmedial line; some dark scaling on termen.

Expanse, 35 mm.

Habitat.—Slopes of Popocatepetl, at 8,000 feet.

Type.—Cat. No. 25629, U. S. Nat. Mus.

Immediately distinguished by the fuscous postmedial space on underside of fore wing.

Hydriomena cedda, new species.

Male.—Palpi dark steel gray. Head and thorax pale green, the patagia irrorated with black. Abdomen whitish with dorsal drab shading; the basal tuft blue black. Fore wings light green with olive green striae, the lines black, the broader markings fuscous edged with black; a broad spot at base of costa extending just below cell; a subbasal thick line wavily outbent, expanding on inner margin; antemedial and medial broad lines, suffusing in cell, narrowing on inner margin; a postmedial line, thick and outbent on costa, irregular, outcurved from 7 to vein 4, only a fine line to vein 3, obsolete to vein 2, fine and vertical below 2; subterminal line similar and parallel with postmedial from costa to vein 5, very constricted at vein 7, outwardly touching an apical spot; below vein 4 there are some traces of black striae which form a double line from vein 2 to tornus; small terminal black spots. Hind wings whitish faintly suffused with avellaneous; a fine lunular postmedial line, and a slightly broader similar subterminal line; some darker shading on termen. Wings below whitish; fore wings with a smoky shade in and beyond cell to a broad postmedial fuscous curved line from costa to vein 2; some dark shading before apex. Hind wings with avellaneous irrorations and only a fine postmedial line; a dark point at upper angle of cell.

Expanse, 31 mm.

Habitat.—Las Vigas, Perote, Mexico.

Type.—Cat. No. 25630, U. S. Nat. Mus.

Hydriomena midaria, new species.

Male.—Palpi fuscous mottled with green. Head, collar, and thorax mottled white, green, and black. Abdomen whitish with some avellaneous irrorations; the curly tuft at base blue black, followed by a black patch; a black spot on anal hairs above. Fore wings green striated with black; the lines as usual black, or fuscous edged with black; basal stripe interrupted on vein 1;

subbasal line fine, outangled in cell, expanding on inner margin; antemedial from quadrate costal spot, fine, double, wavy; median line broad, wavy to vein 3 where it forms a round spot is slightly inbent and vertical below vein 2, being joined at 2 by a spot and streak from median; postmedial and subterminal from rather large costal spots, outbent to vein 6, then slightly inbent and broken up into coarse striae; black terminal spots preceded by some slightly whitish shading. Hind wings tiller buff faintly tinged with avellaneous and with similar irroration; postmedial line faintly indicated; cilia whitish. Fore wings below whitish buff suffused with fuscous except on margins; a black postmedial spot on costa and curved dark line; other spots on costa indistinct. Hind wings below whitish irrorated with avellaneous; a fine postmedial line.

Expanse, 36 mm.

Habitat.—Volcan Santa Maria, Guatemala.

Type.—Cat. No. 25631, U. S. Nat. Mus.

Allied to *H. ranuncula* Dognin.

Hydriomena morelosia, new species.

Male.—Palpi white with a lateral fuscous patch before tip. Head white, the vertex mottled with green and black. Thorax mottled green and white with some black scales. Abdomen whitish, dorsally irrorated with fuscous, less so at base. Fore wings green, the markings fuscous edged with black; a basal streak from costa not reaching inner margin; a narrow subbasal line, outangled above median, then vertical; antemedial broad, outangled in cell, closely followed by the narrower medial line which is less oblique on costa, both lines somewhat interrupted below subcostal and almost vertical from cell to inner margin; postmedial broad from costa to vein 4, then obsolete to vein 2, narrow below it to inner margin; subterminal from a costal spot, outset and broad from below vein 7 to below vein 4, fine and outcurved to vein 3, broader and curved to vein 2, then parallel with postmedial; paired terminal black spots; cilia vinaceous drab with roseate spots. Hind wings buffy brown; cilia whitish buff with dark spots.

Expanse, 31 mm.

Habitat.—Popocatepetl Park, Mexico; also from Morelos.

Type.—Cat. No. 25632, U. S. Nat. Mus.

This species is figured in the *Biologia Centrali Americana* Heterocera, pl. 56, fig. 21, as the female of *Hydriomena cydra* Druce.

***Hydriomena vulcinaria*, new species.**

Male.—Head, collar, and thorax mottled black and white. Abdomen white thickly irrorated with mouse gray and black leaving segmental white lines. Fore wings grayish white irrorated with darker scales; base black followed by a yellow green shade to subbasal line which is black, oblique on costa, excurved and outbent below cell; antemedial and medial lines suffusing in cell, deep mouse gray edged with black; the similar postmedial and still broader subterminal bands slightly oblique to vein 3, then inset, the subterminal followed by pale green mottling; termen with trigonate black spots; the lines on costal margin preceded by yellow green spots; some green scaling on inner margin. Hind wings silvery white suffused with mouse gray darkest on termen; faint postmedial and subterminal lines. Fore wings below silvery smoky gray with traces of darker postmedial and subterminal shades, the latter fuscous on costa; whitish spots on costa. Hind wings below silky white irrorated with mouse gray forming postmedial and subterminal lines.

Expanse, 31 mm.

Habitat.—Slopes of Popocatepetl, Mexico, at 13,000 feet.

Type.—Cat. No. 25633, U. S. Nat. Mus.

Nearest *Hydriomena proba* Druce found at the same locality. The colors of the hind wings immediately distinguish the two species.

***Hydriomena stylites*, new species.**

Male.—Palpi fuscous; frons white; vertex salmon buff with some tawny hairs and a transverse black line in front. Collar and thorax salmon buff, the collar with a reddish brown stripe and similar shading on thorax in front and on patagia. Abdo-

men grayish buff with some darker irrorations above and some fuscous dorsal spots and transverse lines. Fore wings cinnamon drab, the markings black; a spot at base of costa; a subbasal line outbent on costa, then curved and oblique to inner margin; antemedial line double filled in with a dark shade, outbent to middle of cell then obliquely incurved to inner margin; a medial incurved line and an outcurved postmedial line suffusing below discocellular and forming a broad fuscous brown shade to inner margin; an ovate whitish spot on discocellular; an outer fine double line from costa filled in with deep quaker drab, wavy, outcurved between veins 4 and 2, then vertical to inner margin; an oblique fuscous spot at apex and traces of a fine broken subterminal line; terminal fuscous points at veins 2 and 3; cilia whitish and gray with darker spots. Hind wings tawny olive, paler on costa; cilia whitish with dark spots at veins. Fore wings below pale avellaneous with traces of postmedial and outer lines. Hind wings below whitish thickly irrorated with light drab; traces of a postmedial and a subterminal curved line.

Expanse, 30 mm.

Habitat.—Orizaba, Mexico.

Type.—Cat. No. 25634, U. S. Nat. Mus.

***Hydriomena simeon*, new species.**

Male.—Palpi deep neutral gray. Head and thorax fawn color. Abdomen avellaneous with darker dorsal and transverse shading. Fore tibiae and tarsi reddish brown, the tarsi with whitish rings. Fore wings avellaneous irrorated with mouse gray; four russet vinaceous spots on costa at origin of antemedial, medial, postmedial and subterminal lines with whitish shading on costal edge between them; a smaller basal spot on costa, and a small subbasal spot, from the latter an outbent fine russet vinaceous line, angled in cell and then almost vertical to inner margin, irrorated with black below cell; antemedial line fine, double, outangled in cell, filled in to within cell and on inner margin with russet vinaceous; medial line fine, indistinct, closely following the antemedial below cell; postmedial line double, widely separated from costa to vein 5, very indis-

tinct, the inner line vertical from lower angle of cell, the outer line outwardly edged by the subterminal russet vinaceous shade which is broad from costa to vein 5, then narrow and wavily outcurved and parallel with termen; some white scaling terminally between veins 5 and 7; a terminal dark line; cilia iridescent dark gray to russet vinaceous. Hind wings buffish isabella, the costa whitish; termen narrowly tawny olive; cilia whitish gray with dark spots at veins. Fore wings below whitish avellaneous, the apex broadly fawn color; dark costal spots separated by light buff. Hind wings below whitish irrorated with wood brown; a wavy postmedial wood brown line, and a fine terminal line.

Expanse, 29 mm.

Habitat.—Las Vigas, Perote, Mexico.

Type.—Cat. No. 25635, U. S. Nat. Mus.

***Hydriomena subgrisea*, new species.**

Male.—Palpi steel black, the base below white. Head, collar, and thorax green; black spots on tegulae outwardly, on thorax anteriorly and on patagia. Abdomen dorsally fuscous or blue black with a small buff spot on each segment posteriorly; laterally and underneath whitish with mouse gray irrorations; the dorsal tuft at base of abdomen blue black. Fore wings green almost entirely effaced by the deep brownish drab transverse bands, the green portions with darker green and fuscous striae, the bands edged with black and partly dark striated; an outbent black basal line; subbasal band slightly outbent; antemedial, medial and postmedial bands suffusing in cell, leaving a narrow green line from median beyond vein 2 to near vein 1 and a curved green line on inner margin from vein 1 to green space preceding the antemedial band; some salmon pink suffusion above veins 1, 2 and 5; the outer edge of postmedial band dentate from costa to vein 5, then lunular; subterminal band very broad especially between veins 7 and 4 where it is deeply outcurved on each interspace, between veins 4 and 3 it is obsolete, this interspace being green, its inner edge between veins 4 and 6 is broadly black; veins on postmedial space

black with some green points; terminal black spots expanding on either side of veins towards base. Hind wings drab; a fine darker terminal shade expanding into spots on whitish cilia. Fore wings below brownish gray, the costa greenish white with quadrate dark spots; cilia white broadly tipped with dark brown. Hind wings below whitish thickly irrorated with brownish gray; a dark discal point and fine postmedial curved line; cilia whitish buff with brown spots at veins.

Expanse, 33 mm.

Habitat.—Volcan Santa Maria, Guatemala.

Type.—Cat. No. 25636, U. S. Nat. Mus.

Nearest *H. confusa* Schaus.

***Hyriomena aldricaria*, new species.**

Male.—Palpi metallic green purple, underneath with a roseate whitish line. Head metallic steel color, with some silvery white scaling on frons. Collar roseate buff. Thorax mottled olive green and fuscous. Abdomen dorsally greenish on basal half and on following segments posteriorly, otherwise with fuscous bands; silvery gray shading laterally; underneath deep neutral gray. Fore wing from base to near middle green, limited by a partly broken almost vertical black line; base narrowly black; a subbasal black line outbent from costa, incurved below cell and outbent forming larger triangular spots on margins; antemedial band consisting of large deep livid brown spots edged with black; medial space orange vinaceous crossed by long green striae, outwardly edged by an irregular black line starting from a triangular spot on costa, narrow, outbent below 7, inangled on 6, incurved along discocellular, and broader between 5 and 3, fine and outcurved below 3, inbent and broken to inner margin, followed throughout by a sinuous green shade; a postmedial spot from costa, very irregular, expanding above 6 to vein 4, deep livid brown edged with black; a similar subterminal sinuous band from inner margin to vein 3; a black brown spot at apex and a smaller subterminal spot below vein 7; terminal triangular spots their base on terminal edge; terminal space otherwise orange vinaceous crossed by green

striae; cilia silky mouse gray. Hind wings silky mouse gray. Wings below silky mouse gray, the fore wing with three white costal spots on outer half, and some marginal white spots from apex to vein 4.

Expanse, 35 mm.

Habitat.—Volcan Santa Maria, Guatemala.

Type.—Cat. No. 25637, U. S. Nat. Mus.

***Hydriomena ciniana*, new species.**

Male.—Palpi deep mouse gray. Head and collar whitish the latter shaded with olive buff. Thorax whitish with some gray scaling. Abdomen whitish buff with some grayish irrorations, the dorsal tuft at base metallic black. Fore wings with a few black irrorations on a whitish or yellow green ground; a black space at base; subbasal, antemedial, and medial fuscous lines from narrow costal spots, outangled in cell and obliquely sinuous to inner margin, sometimes the lines are suffused together by dark shading but always retain their general outline; postmedial line finely lunular, oblique from costa, incurved below vein 5 to lower angle of cell, then outcurved, usually obsolete; a broader subterminal fuscous shade with irregular edges, becoming narrow below vein 5, lunular and parallel with termen; a small dark apical spot; a dark terminal line expanding into small spots. Hind wings drab showing the discal spot and postmedial line of underside; a fine darker terminal shade with spots on pale cilia. Fore wings below whitish gray suffused with brownish drab; a fine dark line on discocellular; an outcurved postmedial line and broader, less distinct, subterminal shade. Hind wings below white irrorated with mouse gray; the postmedial line sharply curved below vein 4; a faint subterminal line.

The female frequently has the postmedial space white.

Expanse, male, 25 mm.; female, 30 mm.

Habitat.—Purulha, Guatemala.

Type.—Cat. No. 25638, U. S. Nat. Mus.

Described from 14 males and 15 females.

Hydriomena ulfrida, new species.

Male.—Palpi grayish mottled with black at tip. Head white crossed by a black line between antennae. Collar and thorax whitish green crossed by black lines. Abdomen above fuscous with some white irrorations subdorsally, underneath cream white. Fore wings pale yellow green; a quadrate white spot at end of cell; a basal purplish fascia edged with black from costa to vein 1; a fine black subbasal line, angled in cell, then vertical, expanding slightly on inner margin; a broad antemedial fascia mostly purple edged with black, vertical from subcostal to inner margin; a quadrate medial spot on costa, and a few black points below cell near antemedial; a postmedial thick line from costa to vein 4, its inner edge curved at white spot in cell, below 4 obsolete with only a small spot on vein 3 and on vein 2, also some black points above inner margin; a broad subterminal fascia from costa to vein 4, joined at vein 7 by an oblique spot from apex, a small spot below vein 3, and a purplish line from vein 2 to inner margin irrorated with black; terminal paired black spots at veins; cilia gray divided by a white line. Hind wings white, faintly grayish in cell and along inner margin; small dark paired spots at veins terminally. Wings below whitish, the fore wings showing the markings of upper side in black; hind wings with a few dark irrorations and a fine postmedial line, the terminal spots as above.

Expanse, 24 mm.

Habitat.—Slopes of Popocatepetl at about 10,000 feet.

Type.—Cat. No. 25639, U. S. Nat. Mus.

Near *H. leucosigna* Dyar.

Hydriomena prisca, new species.

Male.—Palpi, head and body white; some suffusion on patagia and the dorsal tuft at base of abdomen pale yellow green. Fore wings pale yellow green, the markings chiefly purplish gray edged with black; six narrow spots on costa tapering behind; basal spot continuing as a fine line to submedian; a subbasal point on median continuing as a fine line, expanding

on inner margin; antemedial an incurved black line from middle of cell to submedian fold, then outcurved, broadly edged outwardly by a purple gray shade which projects on vein 2, again above fold and on vein 1, and is closely followed by some small points forming part of the otherwise obsolete medial line; postmedial consisting of a reversed query mark between veins 6 and 4, and points on veins 3 and 2; subterminal represented by an irregular spot between veins 6 and 4, a fine inbent line from below vein 3 to vein 2, then broader and wavy to inner margin; terminal purplish spots on veins and cilia. Hind wings whitish gray with dark terminal spots on veins and cilia. Fore wings below light smoky gray, the costa and termen broadly whitish green, the costal and terminal spots as above, also the postmedial and subterminal spots between veins 6 and 4. Hind wings below white irrorated with dark gray; a dark point at upper angle of cell; a fine dentate postmedial and subterminal line; no terminal spots.

Expanse, 27 mm.

Habitat.—Guatemala City.

Type.—Cat. No. 25640, U. S. Nat. Mus.

***Hydriomena aztecaria*, new species.**

Male.—Palpi silvery steel. Head, collar, and thorax mottled pale green, white, and black. Abdomen whitish buff, suffused dorsally with fuscous gray, leaving white segmental lines. Fore wings light green, the lines black, the broader lines whitish gray thickly striated and irrorated with black, also edged with black; a thick basal line from costa to submedian; sub-basal line outbent on costa, angled in cell and almost vertical to inner margin; antemedial broad, wavy; medial line fine, suffusing with antemedial in cell, and again below cell; postmedial fine, wavy, suffusing with a black spot on discocellular, then inbent and suffusing with medial at vein 2, diverging at fold, but connected with medial by some white scales on submedian; subterminal broad, obsolescent between veins 4 and 3; a black spot at apex; small black, trigonate, terminal spots partly united; cilia white divided by a gray line and with black

spots. Hind wings white; small paired smoky spots terminally at veins. Fore wings below silvery gray showing the markings of upper side; some whitish yellow spots on costa; a dark terminal line. Hind wings below silvery white thinly irrorated with avellaneous; a very faint postmedial line; a fine terminal line.

Expanse, 24 mm.

Habitat.—Popocatepetl Park, Mexico.

Type.—Cat. No. 25641, U. S. Nat. Mus.

***Hydriomena sylvaria*, new species.**

Male.—Palpi fuscous. Head, collar, and thorax white, the patagia mottled with gray. Abdomen buff white dorsally tinged with gray leaving the segmental lines white; underneath silvery white. Fore wings brownish drab, the markings grape green; an outbent subbasal fascia followed by some black irrorations; an elongate antemedial spot on costa, and a faint double black line; a medial costal spot and a double, well separated black line from subcostal slightly outcurved to inner margin; postmedial line similar edging the costal spot, and faintly filled in with grape green to inner margin; subterminal outbent at vein 7, fine, black, lunular dentate, broadly edged outwardly with grape green; cilia with some greenish spots at base. Hind wings white faintly tinged with drab; traces of a subterminal grayish shade; cilia white with dark points. Fore wings below drab gray; a yellow white postmedial costal spot, and a smaller subterminal spot; cilia white at base interrupted by fuscous spots and with dark tips. Hind wings below white with a few avellaneous irrorations, and black spots on cilia.

Female.—The basal fascia brighter, whiter, outwardly edged by a black line; the medial lines on inner margin suffusing and forming a black patch; beyond medial costal spot an irregular white spot to discocellular at vein 4; a round white spot circled with black between veins 2 and 3 near cell; postmedial obsolescent except on costa and from vein 2 to inner margin where it is outbent; the marginal green shade edged on both sides with black, brighter than in male.

Expanse, male, 27 mm.; female, 30 mm.

Habitat.—Popocatepetl Park, Mexico.

Type.—Cat. No. 25642, U. S. Nat. Mus.

***Hydriomena mainaria*, new species.**

Male.—Palpi fuscous fringed above with white. Head, collar, and thorax fuscous; some white on frons; neck white; white mottling on patagia. Abdomen whitish buff, dorsally suffused with brownish gray. Fore wings fuscous, the veins irrorated with black, also the cell and inner margin; faint traces of a postmedial curved line, and a dentate subterminal line; basal half of cilia brownish at base, darker outwardly, the outer half whitish divided by a gray line. Hind wings white slightly suffused with brownish gray; a very faint double postmedial line, the most distinctive character of this inconspicuous species; a darker narrow terminal shade; cilia white. Fore wings below silvery white suffused with brownish gray from above cell and vein 2 to costa; the veins dark; a fine, straight, postmedial line from costa to vein 2; a subterminal fuscous shade, wide on costa, then narrower to vein 2; a terminal fuscous line; cilia whitish tipped with fuscous. Hind wings below silvery white with a few avellaneous irrorations and terminal line.

Expanse, 26 mm.

Habitat.—Popocatepetl Park, Mexico.

Type.—Cat. No. 25643, U. S. Nat. Mus.

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